Vol. 932 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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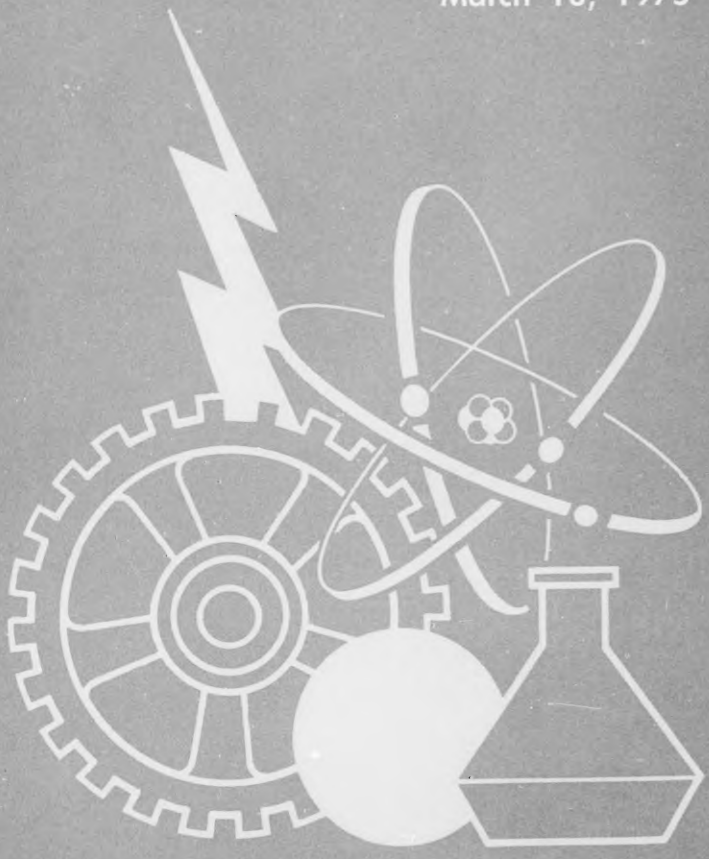
PATENTS

March 18, 1975



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

March 18, 1975 Volume 932 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Final Rejection—First Action Practice

This notice revises M.P.E.P. section 706.07(b) and supersedes the notice of March 20, 1969, appearing at 861 O.G. 1011.

The claims of a new application may be finally rejected in the first Office action in those situations where (1) the new application is a continuing application of, or a substitute for, an earlier application, and (2) all claims of the new application (*a*) are drawn to the same invention claimed in the earlier application, and (*b*) would have been properly finally rejected on the grounds or art of record in the next Office action if they had been entered in the earlier application.

However, it would not be proper to make final a first Office action in a continuing or substitute application where that application contains material which was presented in the earlier application after final rejection or closing of prosecution but was denied entry for one of the following reasons:

(1) New issues were raised that required further consideration and/or search, or

(2) The issue of new matter was raised.

Further, it would not be proper to make final a first Office action in a continuation-in-part application where any claim includes subject matter not present in the earlier application.

A request for an interview prior to first action on a continuing or substitute application should ordinarily be granted.

Feb. 20, 1975.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents on or before April 11, 1975.

Day, Jseph A., 330 University Ave., Toronto, Ontario, Canada

Garrett, Kenneth M., 214 King St. W., Toronto, Ontario, Canada

Geissler, Bernhard H., 1321 Hampden Road, Bartlesville, Okla. 74003

Jay, Mark H., 232 Garden St., Hartford, Conn. 06105

Perlin, Meyer, 10617 Vale Road, Oakton, Va. 22124

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,879,383, T. W. Powell, SIGNAL MONITORING APPARATUS; **3,353,235,** same, CODED SIGNAL ALERTING DEVICE, **filed** Oct. 11, 1974, D.C., M.D. Fla. (Tampa), Doc. 74–602–C *Truman W. Powell, also known as Joe Powell* v. *Rollins Protective Service.*

3,106,640, W. H. Oldendorf, RADIANT ENERGY APPARATUS INVESTIGATING SELECTED AREAS OF THE INTERIOR OF OBJECTS OBSCURTD BY DENSE MATERIAL, **filed** July 8, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–1882, *EMI Limited* v. *William H. Oldendorf.* Filed stipulation for dismissal with prejudice, entered Oct. 10, 1974.

3,112,018, C. S. Gehrie, VALANCE, **filed** Dec. 18, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c3187, *Presto Lock Company* v. *Stebco Products Corporation.* Enter judgment that the complaint against Stebco Products be dismissed without prejudice, that defendant Tremco Mfg. and Engineering, Inc. be enjoined, Oct. 18, 1974.

3,126,841, E. R. Nay, APPARATUS FOR MANUFACTURING SNOW CONES, **filed** Oct. 17, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV 74–2963–RF, *Eugene R. Nay* v. *Clarence R. Wilhelmi.*

3,213,553, R. Foy, HYDRAULICALLY ADJUSTABLE DOZER BLADE, **filed** Nov. 1, 1974, D.C., N.D. Ohio (Cleveland), Doc. C74–998, *Richard Foy and Ruth Pickering Weil* v. *J. I. Case Company.*

3,227,273, Syverson and Syverson, PACKAGE; **3,289,385,** same, METHOD OF PACKAGING, **filed** Dec. 21, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c3212, *Compack Industries Inc.* v. *M.B. Packing Co. and Martin Smoler.* Stipulated dismissal of action, pursuant to the provision of Rule 41(a)(1)(ii), parties agree to the dismissal without prejudice of Counts I, II and III but with prejudice of Count IV, Oct. 15, 1974.

3,267,934, W. E. Thornton, ELECTROCARDIAC COMPUTER, **filed** Oct. 21, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV 74–3008–AAH, *Del Mar Engineering Laboratories* v. *Physio-Tronics, Inc.*

3,289,385. (See 3,227,273.)

3,289,568, R. L. Ronning, PRODUCT PELLETING AND COOLING APPARATUS; **3,429,349,** same, PULL-THROUGH HAMMER MILL; **3,643,404,** Same, METHOD AND APPARATUS FOR ENHANCING THE SEPARATION OF PARTICULATE MATERIAL FROM AN EFFLUENT STREAM, **filed** May 13, 1974, D.C., N.D. Ohio (Toledo), Doc. C–74–181, *Richard L. Ronning* v. *Verhoff Alfalfa Mills.* Plaintiff is owner of all right, title and interest. Patent is valid and infringed by defendant. Defendant is enjoined from further infringements, May 14, 1974.

3,289,767, Seward and Myers, WELL CENTERING AND CEMENTING DEVICE, **filed** Oct. 23, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV 74–3072, *B & W Incorporated* v. *Chromally American Corporation.*

3,358,235. (See 2,897,383.)

3,402,436, H. Oetiker, CLAMP CONSTRUCTION, **filed** Oct. 8, 1974, D.C. Del. (Wilmington), Doc. 74–201, *Hans Oetiker* v. *Chrysler Corporation.*

3,403,868, W. P. Lear, MAGNETIC TAPE CARTRIDGE SYSTEM, **filed** Oct. 17, 1974, D.C. Ariz. (Phoenix), Doc. C–74–678 Phx, *The Gates Rubber Company* v. *Data Packaging Corporation et al.*

3,404,622, R. L. Flanagan, MOBILE VEHICLE PRESS; **Re. 27,194,** same, **filed** Oct. 25, 1974, D.C. Oreg. (Portland), Doc. C–74–832, *Mobile Auto Crushers Corporation of America* v. *Merlin W. Fjarli.*

3,419,876, Edwards and Winterstein, STREAMLINED ANTENNA AND METHOD OF MAKING THE SAME, **filed** May 25, 1973, D.C., N.D. Ohio (Cleveland), Doc. C73–534, *Sterling Manufacturing Co., doing business as Tenatronics, Ltd.* v. *Radio Shack, a division of Tandy Corp.* Court dismisssed plaintiff's action on the ground it had failed to prove ownership of the patent in the plaintiff's corporation, or that the plaintiff was the proper party to institute the action, Oct. 25, 1974.

3,423,505, Crawley and Abelseth, RABIES VACCINE AND PROCESS FOR PREPARATION THEREOF, **filed** Sept. 27, 1974, D.C., S.D.N.Y., Doc. 74–C–4243, *Philips Roxanne, Inc.* v. *Richardson-Merrell, Inc. and Connaught Laboratories Ltd.*

3,429,349. (See 3,289,568.)

3,459,558, Farmer and Chandler, COFFEE PELLET PROCESS, **filed** June 21, 1972, D.C., S.D. Tex. (Houston), Doc. 72–H–819, *Farmer Bros. Co.* v. *Coca-Cola Company, Inc.* Filed final judgment and order that said patent is invalid, void and unenforceable and plaintiff's complaint is dismissed with prejudice, entered Oct. 30, 1974.

3,502,908, A. O. Christensen, TRANSISTOR INVERTER CIRCUIT, **filed** Oct. 29, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3104, *Teletype Corp.* v. *Shell Oil Co.*

3,546,921, Bourke, Harris and Muff, METHOD OF PRODUCING AN INITIAL THERMAL ARREST IN THE COOLING CURVE OF HYPEREUTECTIC CAST IRON; **Re. 26,409,** R. J. Hance, EXPENDABLE PHASE CHANGE DETECTOR DEVICE, **filed** Dec. 23, 1971, D.C., E.D. Pa. (Philadelphia), Doc. 71–3056, *Leeds & Northrup Company and Foundry Engineers, Incorporated* v. *Electro-Nite Co.* Consent judgment, patent is valid and owned by plaintiffs. Plaintiffs waive their claim for an injunction and the complaint and counterclaim are hereby dismissed with prejudice, July 30, 1974.

3,570,393, F. R. Schy, TACO SHELL FORMING AND COOKING APPARATUS, **filed** Oct. 25, 1974, D.C., C.D. Utah (Salt Lake City), Doc. C–74–335, *Khyber Food Products, Inc. and Mexican Food Machinery and Manufacturer, Inc.* v. *Clover Club Foods Company, Inc.*

3,629,931, J. M. Stanley, METHOD AND APPARATUS FOR NAILING A STRUCTURAL FRAME, **filed** June 3, 1974, D.C., N.D. Ga. (Atlanta), Doc. C74–1078A, *Multi-Systems, Inc.* v. *Staple Fastener Company et al.* Consent judgment enjoining defendants and dismissing the complaint with prejudice, Oct. 30, 1974.

3,643,404. (See 3,289,568.)

3,665,477, Budrow and Reed, ELEVATABLE AND FOLDABLE ANTENNA, **filed** Aug. 15, 1974, D.C., N.D. Ind. (South Bend), Doc. S74–174, *Barker Manufacturing Company, Inc.* v. *Cobra Industries, Inc.*

3,672,256, W. B. Kosmowski, CENTRIFUGAL CHUCK DEVICE; **3,687,467,** same, COLLET; **3,795,455,** same, MACHINE TOOL HAVING CENTRIFUGALLY ACTUATED COLLET, **filed** Mar. 26, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–787–R, *Digital Systems, Inc.* v. *Advanced Controls Corp. et al.* Filed defendant's notice of dismissal with prejudice, Oct. 21, 1974.

3,687,467. (See 3,672,256.)

3,711,920, R. L. Simmons, Jr., PIPE PULLER AND ALIGNMENT CLAMP, **filed** Oct. 24, 1974, D.C., E.D.N.C. (Wilmington), Doc. 74–37–C–7, *Richard L. Simmons* v. *Brown & Root, Inc.*

3,719,389, Burton and Kiger, THERMO PLASTIC TUBING FURNITURE, **filed** July 11, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–1964–F, *Terra Furniture* v. *Grant Electric Company.* Filed Consent Judgment and order thereon that defendants are permanently enjoined from infringing plaintiff's patent, entered Oct. 22, 1974.

3,784,084, C. C. Pearl, BAG WITH BAIL HANDLE, **filed** Oct. 9, 1974, D.C., E.D. Pa. (Philadelphia), Doc. C.A. 74–2625, *APL Corporation* v. *S. Walter Packaging Corporation.*

3,795,455. (See 3,672,256.)

3,807,110, C. J. Kaminski, MULTIPURPOSE ROOF PENETRATING CURB, **filed** Oct. 25, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3092, *The Pate Company* v. *RPS Corporation and R. Resech, individually.*

3,815,604, O'Malley and Heintz, Sr., APPARATUS FOR INTRAOCULAR SURGERY, **filed** Oct. 22, 1974, D.C., N.D. Calif. (San Francisco), Doc. C–74–2263, *David Kopf Systems* v. *Berkeley Bio-Engineering Inc.*

Re. 26,409. (See 3,546,921.)

Re. 26,724, R. L. Paquin, REFRIGERATED TUMBLER, **filed** July 2, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1583, *Glacier Ware, Inc.* v. *Jet-X Corp. and Goldblatt Bros.* Motion of Jet X Corporation for leave to intervene as a defendant in the patent infringement count in this action to be bound by the final judgment is granted. Joint motion of the parties for the entry of final judgment in this cause is granted, Nov. 1, 1974.

Re. 27,194. (See 3,404,622.)

Certificates of Correction for the Week of Mar. 18, 1975

3,501,998	3,829,570	3,846,840	3,854,947
3,560,902	3,831,092	3,846,894	3,855,164
3,632,428	3,832,409	3,846,988	3,855,377
3,679,368	3,832,682	3,848,032	3,855,381
3,688,141	3,833,489	3,848,035	3,855,450
3,753,855	3,833,641	3,848,104	3,855,451
3,755,172	3,833,718	3,848,463	3,855,652
3,769,328	3,835,204	3,849,038	3,855,841
3,784,570	3,835,820	3,849,129	3,855,868
3,784,576	3,836,712	3,849,143	3,856,706
3,787,576	3,837,620	3,849,732	3,856,967
3,792,403	3,837,698	3,849,786	3,857,792
3,795,813	3,837,871	3,849,873	3,857,890
3,798,165	3,838,167	3,850,098	3,858,415
3,798,227	3,838,210	3,850,684	3,858,436
3,799,398	3,839,849	3,851,042	3,858,799
3,800,593	3,840,912	3,851,123	3,859,048
3,800,606	3,842,005	3,851,287	3,859,157
3,801,669	3,842,536	3,851,388	3,859,310
3,803,313	3,842,964	3,851,489	3,859,340
3,804,871	3,843,193	3,851,843	3,859,526
3,808,274	3,843,341	3,852,173	3,859,805
3,810,942	3,843,474	3,852,441	3,859,854
3,810,983	3,843,634	3,852,584	3,859,968
3,812,177	3,843,656	3,852,656	3,859,996
3,814,729	3,843,682	3,852,743	3,860,109
3,819,523	3,843,872	3,852,766	3,860,335
3,819,671	3,844,105	3,853,450	3,860,647
3,821,395	3,844,663	3,853,525	3,860,741
3,822,283	3,844,795	3,853,776	3,861,188
3,823,782	3,845,005	3,853,917	3,861,647
3,825,825	3,846,258	3,853,991	3,861,739
3,825,882	3,846,382	3,854,270	3,861,792

PATENT EXAMINING CORPS

AMOCO OIL CO.

WILLIAM FELDMAN, Acting Assistant Commissioner

MAR 24 1975

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 15, 1975

RESEARCH LIBRARY

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-6-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—R. F. BURNETT, Acting Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-11-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-6-73
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-13-73
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-1-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	7-10-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-22-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-22-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-20-73
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	9-10-73
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	6-27-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-1-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-23-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-13-74

Expiration of patents: The patents within the range of numbers indicated below expire during March 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,825,064 to 2,828,486, inclusive
Plant Patents..... Numbers 1,686 to 1,693, inclusive

REISSUE PATENTS

GRANTED MARCH 18, 1975

ERRATA

For CLASS	See PATENT NO.
264–051	28,364
200–086	28,365
239–333	28,366
052–079	28,367
241–088.4	28,368

REISSUES

MARCH 18, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

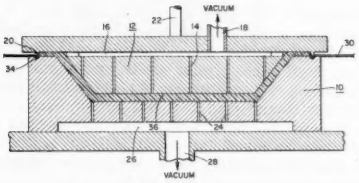
28,364
METHOD FOR FORMING FOAM ARTICLES

Marshall L. Corazza, Glen Mills, Pa., by Scott Paper Co., Philadelphia, Pa., assignee

Original No. 3,484,510, dated Dec. 16, 1969, Ser. No. 470,776, July 9, 1965. Application for reissue June 13, 1973, Ser. No. 369,487

Int. Cl. B29d *27/00*

U.S. Cl. 264—51 5 Claims



7. A process for forming a solidified body from a sheet of thermoplastic, closed cell, foam material having opposed faces, said method comprising the steps of:

(1) heating said thermoplastic sheet to render the same deformable without destroying the cellular character thereof;

(2) positioning said sheet between opposed male and female members, said members, when brought into final forming position, defining a cavity therebetween which includes a bottom region and a side region;

(3) relatively moving said mold members into final forming position for engaging the sheet while said sheet is in a heated condition, and stretching said heated sheet into a configuration generally assuming the configuration of said cavity, but incompletely filling the cavity in the bottom and side regions thereof; and

(4) simultaneously applying vacuum to opposed faces of said stretched sheet in said bottom and side regions of the cavity for causing said sheet to expand into close conformity with said mold members in said bottom and side regions for forming an article having a lower density, greater thickness and greater flexure strength than the heated sheet prior to stretching.

28,365
PRESSURE-OPERATED LAYERED ELECTRICAL SWITCH AND SWITCH ARRAY

Charles E. Braue, Bronx, N.Y., assignor to Data Appliance Corporation

Original No. 3,617,666, dated Nov. 2, 1971, Ser. No. 33,367, Apr. 30, 1970. Application for reissue June 27, 1973, Ser. No. 374,091

Int. Cl. H01h *43/08*

U.S. Cl. 200—86 29 Claims

1. An electrical switch which is closed by the application of pressure against an area of the switch and is opened when the pressure is removed comprising

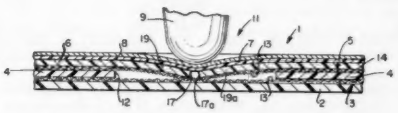
a. an electrically nonconductive base;

b. a first electrically conductive layer positioned against such base;

c. a nonconductive separator means placed against the side of the conductive layer opposite the base, said separator means having an opening therein;

d. a second electrically conductive layer placed against the side of the separator means opposite the first conductive layer;

e. a layer of nonconductive noncompressible material placed against the side of the second electrically conductive layer opposite the nonconductive layer means,



said noncompressible layer having an elongated opening positioned adjacent the opening in the separator means; and

f. a pressure-responsive deflectable portion of the noncompressible layer positioned adjacent the opening capable of being deflected down into said opening

whereby the application of pressure transmitted to and against the pressure-responsive deflectable portion causes said portion to move a portion of the second conductive layer against the first conductive layer to close the switch.

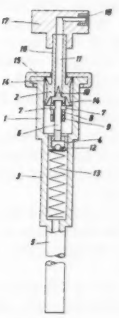
28,366
ATOMIZING PUMP

Fred Pechstein, Berlin, Germany, assignor to Firma Rudolf Albert, Hemer, Germany

Original No. 3,399,836, dated Sept. 3, 1968, Ser. No. 595,761, Nov. 21, 1966. Application for reissue July 30, 1973, Ser. No. 383,504

Int. Cl. B05b *1/00*

U.S. Cl. 239—333 13 Claims



1. A pump assembly for conveying liquids to be atomized and comprising, in combination:

(a) first means defining a first variable volume space and a fluid flow passage in communication with said first space;

(b) second means defining a second variable volume space in communication with said first space;

(c) first valve means associated with said first means and disposed for isolating said passage from said first space;

(d) connecting means connecting said second means to said first valve means for controlling the opening and closing of said valve means and for providing a limited degree of relative movement between said first valve means and said second means; [and]

(e) biasing means associated with said second means for urging it into a condition corresponding to the minimum volume of said second space[.] ;

(f) and further valve means for preventing back flow of fluid from said first variable volume space to said second variable volume space.

28,367

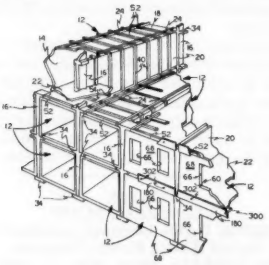
BUILDING

Frank D. Rich, Jr., Darien, and Alexander D. McDonald, Stamford, Conn., assignors to F. D. Rich Housing Corporation, Stamford, Conn.

Original No. 3,750,366, dated Aug. 7, 1973, Ser. No. 163,274, July 16, 1971, which is a continuation-in-part of abandoned application Ser. No. 4,156, Jan. 19, 1970. Application for reissue June 6, 1974, Ser. No. 476,948

Int. Cl. E04h *1/12, 9/06*

U.S. Cl. 52—79 **11 Claims**



1. A multi-story building of modular construction including

a plurality of modular box beams of substantially similar structural strength, each said beam enclosing at least one room of the interior space of said building,

said box beams being in spaced horizontal layers and in spaced vertical alignment,

a plurality of vertical columns for supporting the weight of said box beams,

said columns being cast-in-situ in laterally and longitudinally spaced apart relation and being positioned between said horizontally spaced box beams adjacent the ends thereof

box beam support members on said columns to receive and support the box beams of the story thereabove,

said box beams being rigidly bonded to said support members, and

said box beams above the ground floor being supported substantially entirely upon said support members and having strength enough to span the space between said support members without support from box beams therebelow,

whereby said box beams have substantially their entire weight carried by said vertical columns.

28,368

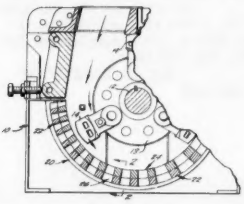
GRATE BAR ASSEMBLY FOR A ROCK CRUSHER

Joseph F. Bonarrigo, Jr., Sykesville, Md. 21784

Original No. 3,617,007, dated Nov. 2, 1971, Ser. No. 863,428, Oct. 3, 1969. Application for reissue Nov. 1, 1973, Ser. No. 411,642

Int. Cl. B02c *13/13, 13/284*

U.S. Cl. 241—88.4 **5 Claims**



4. A grate bar assembly for a rock crusher comprising:

at least one lower grate element having bars spaced by openings extending from the upper face to the lower face thereof,

and at least one upper grate element having bars spaced by openings extending from the upper to the lower face thereof,

said upper grate element being supported on said lower grate element for ready removal and replacement when worn,

the openings in said upper grate element being of a size to permit passage therethrough of crushed material of a desired diameter,

the openings in said lower grate element being of size at least equal to the size of the openings in said upper grate element so as to not impede passage therethrough of such material passed through the openings in said upper grate element,

the openings in said upper and lower grate elements being in registry,

said upper grate element being formed of high abrasion resistant metal,

said lower grate element being formed of metal of high strength.

28,369

RING A UNSATURATED - 20 - OXO-11,17-BIS-OXYGENATED 16-METHYL STEROIDS OF THE PREGNANE SERIES

Glen E. Arth, Cranford, David Johnston, Warren, and Lewis H. Sarett, Skillman, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original No. 3,375,261, dated Mar. 26, 1968, Ser. No. 563,658, July 8, 1966, which is a continuation-in-part of abandoned applications Ser. No. 642,655, Feb. 27, 1957, and Ser. No. 752,180, July 31, 1958. Application for reissue Sept. 10, 1974, Ser. No. 504,832

Int. Cl. C07c *169/32*

U.S. Cl. 260—397.45 **20 Claims**

6. [A 17-oxygenated-pregnane as defined in claim **1**, which has the chemical name] 16α-methyl-1,4-pregnadiene-11β,17α,21-triol-3,20-dione.

PLANT PATENTS

GRANTED MARCH 18, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,691
CHRYSANTHEMUM PLANT

Barrie John Machin, East Broyle Estate, Chichester, England, assignor to Framptons Nurseries Limited, Worthing, England

Filed July 23, 1973, Ser. No. 381,665
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, substantially as shown and described, characterized particularly as to novelty by the unique combination of a yellow color; small, hard and crisp pompon-like flowers, the production of a flowering shoot from a majority of the leaf axils above the compost level following a pinch; and good, uniform flowering regardless of whether the apical flower on each shoot is disbudded.

3,692
CHRYSANTHEMUM PLANT

Barrie John Machin, East Broyle Estate, Chichester, England, assignor to Framptons Nurseries Limited, Worthing, England

Filed July 23, 1973, Ser. No. 381,666
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, substantially as shown and described, characterized particularly as to novelty by the unique combination of a yellow color, short internode length, and uniform response in poor winter light conditions.

3,693
CACTACEAE PLANT FAMILY

Barnell L. Cobia, Winter Garden, Fla., assignor to B. L. Cobia, Inc., Winter Garden, Fla.

Filed Jan. 17, 1974, Ser. No. 434,025
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct hybrid plant variety of the Cactaceae family as described and illustrated and which is primarily distinguished by growth habit that combines the following characteristics:

1. A faster growth rate than its parents.
2. A more upright and compact appearance than its parents,
3. Generally broader and thicker cladophylls than its parents,
4. A hardier growth habit with greater resistance to nutrient deficiences and fungus diseases than its parents,
5. Greater resistance to flower bud abscission than its maternal parent, and
6. A generally larger flower than its maternal parent and which has
   (a) a bloom life from about 5 to about 8 days,
   (b) broader tepel blades than its parents, and
   (c) perianth tube laminating and forming tepals with generally less recurve tendencies than its parents, and with marginal blade areas that in color are dominated by pink, red and/or reddish orange hues.

PATENTS

GRANTED MARCH 18, 1975

ERRATA

For CLASS	See PATENT NO.
056–328	3,871,040
117–368	3,871,065
029–252	3,871,053
029–267	3,871,054
029–267	3,871,055
029–283	3,871,056
029–427	3,871,057
029–403	3,871,058
029–427	3,871,059
029–428	3,871,060
029–431	3,871,061
029–470	3,871,062
029–470.5	3,871,063
029–475	3,871,064
029–560	3,871,066
029–571	3,871,067
029–590	3,871,068
029–596	3,871,069
029–598	3,871,070
029–628	3,871,071
029–628	3,871,072
029–034.2	3,871,073
030–040.1	3,871,074
030–040.1	3,871,075
030–060.5	3,871,076
030–063	3,871,077
030–090.1	3,871,078
030–294	3,871,079
030–346.51	3,871,080
034–092	3,871,107
042–001	3,871,120
072–020	3,871,221
072–238	3,871,222
072–402	3,871,223
072–413	3,871,224
072–452	3,871,225
072–456	3,871,226
072–476	3,871,227
084–001.16	3,871,247
118–412	3,871,280
105–008	3,871,276
105–031	3,871,277

PATENTS

GRANTED MARCH 18, 1975

ERRATA—Continued

For CLASS	See PATENT NO.
105–378	3,871,278
105–410	3,871,279
109–029	3,871,281
109–031	3,871,282
109–056	3,871,283
109–059	3,871,284
110–008	3,871,285
110–008	3,871,286
110–008	3,871,287
137–231	3,871,422
175–016	3,871,485
175–100	3,871,486
175–248	3,871,487
175–406	3,871,488
177–001	3,871,489
177–010	3,871,490
177–045	3,871,491
187–095	3,871,494
273–026	3,871,647
215–223	3,871,662
424–340	3,872,104
423–371	3,872,136
178–007.6	3,872,248
260–307	3,872,298
312–290	3,872,342
357–004	3,872,359
317–003	3,872,370
325–042	3,872,381
333–070	3,872,399
240–052.1	3,872,428

PATENTS

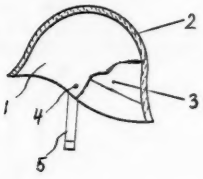
GRANTED MARCH 18, 1975

GENERAL AND MECHANICAL

3,871,026
CERAMIC REINFORCED HELMET

Erhard Dorre, Plochingen, Germany, assignor to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung, Dusseldorf, Germany

Filed Dec. 15, 1972, Ser. No. 315,423
Int. Cl. F41h *1/06*
U.S. Cl. 2—6 **7 Claims**

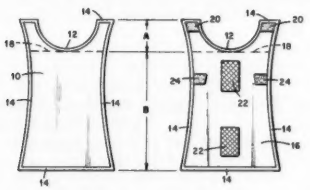


1. A helmet comprising a laminar shell of substantially uniform thickness and of arcuate section in three planes perpendicular to each other, said shell including a metallic base layer having an outer, substantially convex face and an inner, substantially concave face, and an outer layer of ceramic material on said convex face, said outer layer essentially consisting of crystalline, non-metallic particles having a hardness value of at least 8 on the Mohs scale and being integrally thermally bonded to each other and to said base layer.

3,871,027
COMBINATION BURP PAD AND BIB

Byron Reid Orr, Oliver Springs, Tenn., assignor to Herman L. Holsopple, Oak Ridge, Tenn., a part interest

Filed Jan. 22, 1974, Ser. No. 435,535
Int. Cl. A41b *13/10*
U.S. Cl. 2—49 R **1 Claim**



1. A disposable baby bib and burp pad which comprises in combination:

a. a rectangularly-shaped absorptive pad having a neck cutout adjacent to the upper end thereof;

b. a layer of relatively impervious material on one surface of said pad overlain by a coextensive layer of liquid-absorbing material on a second surface thereof;

c. pressure-sensitive adhesive tabs bonded to the upper end of the pad between said neck cutout and the sides of said pad;

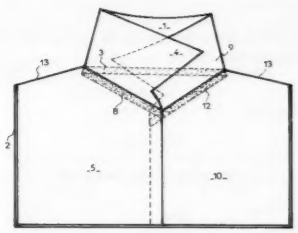
d. a crease line located below said neck cutout whereby material enclosing said neck cutout is folded back upon itself thereby forming a burp pad; and

e. at least one pressure-sensitive adhesive tab bonded along the center line of said impervious material whereby said pad is removeably attached to the clothing of the wearer.

3,871,028
METHOD OF ASSEMBLING NECK ACCESSORIES TO CLOTHING ARTICLES AND ARTICLES THUS OBTAINED

Claude Raymond Pierron, Epinal; Jean Paul Joseph Jenny, Decines, and Robert Zuccaro, Epinal, all of France, assignors to Plymatic, Darnieulles, France

Filed Aug. 2, 1973, Ser. No. 384,956
Claims priority, application France, Aug. 31, 1972, 72.30971
Int. Cl. A41b *3/04*
U.S. Cl. 2—143 **8 Claims**

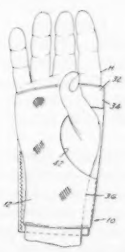


1. Method of manufacturing garments provided along neck lines with neck accessories such as collars, hoods, masks, neck reinforcements, said method comprising the steps of forming separately said neck accessories from at least one auxiliary band of supple material, moving at least one main web of supple material along a continuous assembly line and subjecting it to a series of automatic fashioning steps including the steps of laying secondary layers of supple material on said main web, cutting and fixing said secondary layers to said web to form said garments, wherein the improvements consist in that said steps of laying, fixing and cutting said secondary layers and the steps of laying and fixing said neck accessories are performed sequentially in a sequence such that the said secondary layers and the said neck accessories are superposed when the finished garments reach the end of the assembly line.

3,871,029
BOWLING GLOVE

George A. Hollman, 7127 Proctor Ave., Detroit, Mich. 48210

Filed Aug. 5, 1974, Ser. No. 494,502
Int. Cl. A63b *71/14;* **A41d** *19/00*
U.S. Cl. 2—161 A **9 Claims**



1. A glove open at its ends to permit it to be inserted over the fingers and hand of a bowler or the like and adapted to

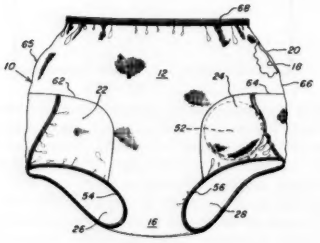
extend along the hand and wrist for preventing the wrist from bending comprising a generally rectangular elongated relatively stiff pad engageable with the back side of the hand and wrist to keep the wrist and hand straight and an elastic band secured at one longitudinal edge thereof to one longitudinal edge of said pad, said pad including a pair of layers of sheet material having interposed therebetween a relatively flat stiffening element, the mating edges of said layers being secured together to enclose said stiffening element, the front portion of said band along the other longitudinal edge thereof being secured to said pad, the rear portion of said band having means for removably securing the band over the hand and wrist to said pad, the portion of said pad along said other longitudinal edge between said front and rear portions defining with said pad an opening through which the thumb of the hand extends when the glove is applied to the hand and wrist.

3,871,030

TENNIS PANTY

Ralph W. Green, Minneapolis, Minn., assignor to Milaca Mills, Inc., Minneapolis, Minn.

Filed Mar. 4, 1974, Ser. No. 447,780
Int. Cl. A41d *1/22*
U.S. Cl. 2—238 **2 Claims**



1. A tennis panty comprising a unitary garment composed of a front panel, a back panel, and a crotch portion connecting said front and back panels, said front panel converging along the lower edge thereof toward said crotch portion, means joining two side edges of said front panel with two side edges of said back panel to form a body encircling garment having a waist opening, a pocket formed to hold a tennis ball composed of a major panel and a minor panel overlying the major panel, said minor panel having its perimeter secured to the major panel except for a portion of the perimeter forming the pocket entrance, and means for joining the perimeter of the major panel to the crotch portion and to the front panel along the lower edge thereof to depend from said front panel and complete the formation of a leg encircling opening for the garment.

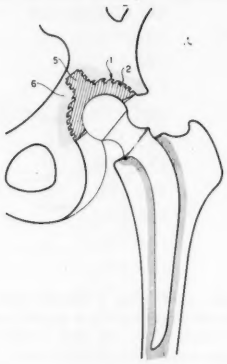
3,871,031

TOTAL HIP PROSTHETIC APPARATUS MADE OF NON-POROUS ALUMINA

Pierre Boutin, Pau, France, assignor to Ceraver, Paris, France

Filed Dec. 12, 1972, Ser. No. 314,461
Int. Cl. A61f *1/22*
U.S. Cl. 3—1 **6 Claims**

1. A prosthetic apparatus designed to replace a natural articulation between two bones, comprising a first hemispherical piece consisting of non-porous alumina to be attached to a first bone by reossification, a second elongated piece to be attached to a second bone, cooperating surfaces on said first and second pieces being formed from non-porous smoothed and ground alumina, the second piece consisting of two portions, one portion of which is a metallic rod and the other portion of which is a head consisting of non-porous alumina secured to the metallic rod, said head providing the cooperating surface of said second piece, the outer convex portion of said hemispherical first piece which is to come into contact with an osseous part of the bone to which it must be secured by reossification including a plurality of anfractuosities of a size sufficient to permit ingrowth of osseous cells, and means for anchoring said first piece to said first bone including a first anchoring projection extending from said outer convex por-



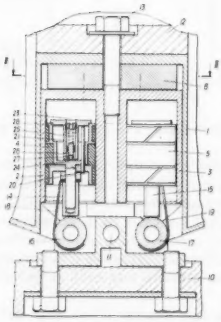
tion along the axis of symmetry of said first piece and a second anchoring projection extending along an axis different from and parallel to the axis of symmetry of said first piece, so that the second anchoring projection will extend into an area of the bone to which it is to be attached which is thicker than the area through which the axis of said first anchoring projection extends.

3,871,032

ARTIFICIAL HYDRAULIC ANKLE JOINT

Wolfgang Karas, Vienna, Austria, assignor to Forschungsinstitut fur Orthopadie-Technik, Vienna, Austria

Filed Apr. 4, 1974, Ser. No. 458,049
Claims priority, application Austria, Mar. 8, 1974, 1928/74
Int. Cl. A61f *1/00, 1/04, 1/08*
U.S. Cl. 3—1.2 **5 Claims**



1. An artificial ankle joint comprising a foot part and a lower leg part, an articulate connection arranged therebetween and a damping device hinged, on the one hand to the foot part and, on the other hand to the lower leg part, which damping device comprises

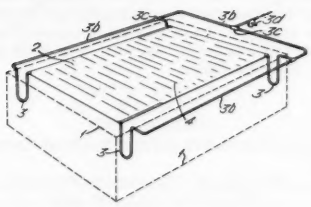
at least two hydraulic cylinders with pressure chambers
connection conduits connecting the hydraulic cylinders
hollow pistons having a bottom part and an upper end and hollow chambers filled with storage oil
pressure-balancing channels in contact with the surrounding atmosphere and guided as far as the upper end of the hollow chambers
a spring-loaded snifting valve arranged between the pressure chamber of each hydraulic cylinder and the hollow chamber of each piston.

3,871,033

SWIMMING POOL COVERS

Sidney Charles Leddra Bartlett, Lower Buckley, Sidbury, Devon Ex10 ORY, England

Filed Feb. 26, 1973, Ser. No. 335,958
Claims priority, application United Kingdom, Feb. 26, 1972, 8983/72
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.13 **2 Claims**



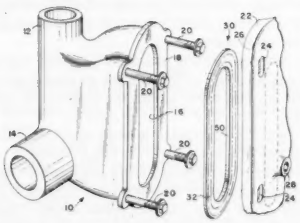
1. A cover for a swimming pool comprising:
i. a flexible imperforate membrane weighted and shaped such that it will rest submerged on the bottom of the pool,
ii. loading means on a single line joining opposite edges of the cover to define a weighted line across said membrane,
iii. means defining air pockets carried by said membrane which when filled with air cause the membrane to float freely and evenly on the surface of the water in the pool and,
iv. means for emptying said pockets of air to cause the membrane to sink firstly along said line weighted and the remainder of the membrane to bend upwards to allow water to by-pass the membrane.

3,871,034

FACE PLATE GASKET

Hugo K. Weigel, Sea Girt, N.J., assignor to Jay R. Smith Mfg. Co., Piscataway, N.J.

Filed Jan. 15, 1973, Ser. No. 323,468
Int. Cl. F16l *21/02*
U.S. Cl. 4—252 R **2 Claims**



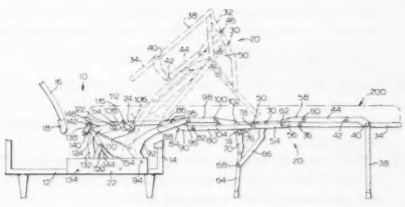
1. In combination, a plumbing fitting having a substantially horizontal conduit terminating in a substantially vertical peripheral face transverse to said conduit, and a face-plate gasket of pliable resilient material for sealing a joint between said face of said fitting and a face plate to be positioned in adjacent communicating relationship with said fitting, said gasket comprising a peripherally extending radially relatively wide and axially thin flange generally parallel to said peripheral face of said fitting and adjacent thereto, said flange having spaced inner and outter margins having opposed sealing faces between them, with one said sealing face being adjacent said substantially vertical peripheral face of the fitting and said other face being adapted to be engaged by a face plate, a plurality of radially spaced apart, endless, peripherally extending beads extending from one said flange face, and generally horizontally extending support means integral with and extending transversely of said flange at said inner margin thereof, said integral support means comprising a peripherally extending lip having inner and outer surfaces, a bead on the outer surface of said lip remote from said flange, said bead engaging said conduit and distorting said lip from an initial position prior to insertion in which said lip extends generally perpendicularly to the plane of said flange of a second inserted position in which said lip is squeezed inwardly by said conduit to thereby produce a reactive force against the conduit wall, whereby said gasket is supported with the flange in a substantially vertical plane by said integral lip.

3,871,035

CHESTERFIELD BED MECHANISM

William Valentine Gerth, 451 Phillip St., Waterloo, Ontario, Canada

Filed Dec. 14, 1973, Ser. No. 425,173
Int. Cl. A47c *17/14*
U.S. Cl. 5—13 **5 Claims**

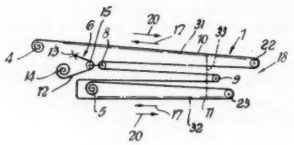


1. In a chesterfield bed frame having a back support and a side with a seat recess extending under and behind said back support, a mechanism foldable in said recess, said mechanism in its bed position providing a mattress supporting member forward of said back support, said support member being divided into a rear section and forward section pivotably connected, said mechanism having a main lever pivotably connected at one end to said frame, said main lever in the bed position extending upwardly and forwardly with respect to said back support, an upwardly extending rear lever pivotably connected at its lower end to said frame at a position rearward of said main lever; a swing lever medially pivoted to the upper end of said rear lever, said swing lever in the bed position extending forwardly for pivotal connection to said rear section, main link means rearwardly pivotably connected to said rear section and forwardly pivotably connected to said forward section, said main link means being medially pivotable on the upper end of said main lever to lower the rear end of said main link means and rotate said swing lever downwardly and rearwardly through the vertical about said rear lever thereby pivoting said rear section under said back support and linkage means operable with said rear lever to further rotate said swing lever upwardly behind said back support to store said rear section.

3,871,036
INVALID TRANSFER DEVICE

David J. Attenburrow, Bridlington, England, assignor to Reed International Limited, London, England

Filed July 6, 1973, Ser. No. 377,008
Claims priority, application United Kingdom, July 10, 1972, 32148/72
Int. Cl. B66f 11/00
U.S. Cl. 5—81 R 6 Claims

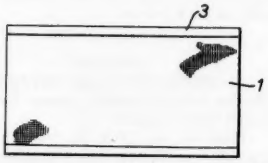


1. A patient transfer device comprising in combination
a. an elongated belt which is wide enough to support a patient,
b. a first take-up and let-out reel connected to one end of said belt,
c. a second take-up and let-out reel connected to the other end of said belt,
d. a plurality of supporting and guiding means,
e. said belt being disposed around said plurality of supporting and guiding means in a back and forth manner so as to provide an upper patient supporting portion and a lower ground engaging portion,
f. driving means associated with said first take-up and let-out reel,
g. driving means associated with said second take-up and let-out reel,
h. a third take-up and let-out device that engages said belt at a point between its upper patient supporting portion and its lower ground engaging portion,
i. first locking means for selectively locking said third take-up and let-out device,
j. second locking means for selectively locking said first take-up and let-out reel, whereby:
1. in a first mode of operation said first reel is driven so that it takes up the belt and the second reel lets out the belt,
2. in a second mode of operation the belt is taken up by the second reel and let out by the first reel,
3. the course of the belt over the supporting and guiding means being such that in each of the first and second modes the belt is moving in the same direction over its upper patient supporting portion and its lower ground engaging portion,
4. said third take-up and let-out device being locked by said first locking means during said first and second modes,
5. in a third mode of operation locking said second locking means and unlocking said first locking means so that when said third take-up and let-out device is actuated the belt will be let out by the second reel and the resulting slack taken up by said third take-up and let-out device, and
6. in a fourth mode of operation said second reel is driven to take up the belt and the third take-up and let-out device lets out the belt slack that it has taken up during the second mode of operation.

3,871,037
INCONTINENCE PADS

Frederick Lane Willington, Plas-y-Felin, Cefnpennar, Mountain Ash, Glamorgan, England

Filed Jan. 4, 1974, Ser. No. 430,654
Int. Cl. A61g 7/02; G61g 9/00
U.S. Cl. 5—91 13 Claims

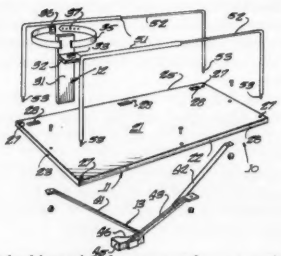


1. An incontinence pad comprising a permeable membrane, normally uppermost, an upper absorbent layer, an upper impervious layer, but with a window formed therein, the upper absorbent layer leaving said window exposed, a lower absorbent layer to which fluid has access through said window, a complete impervious layer, normally lowermost, and means sealing the edges of the pad the window being of lesser area than said absorbent layers.

3,871,038
PORTABLE BED

Junior Albert Trivett, 130 3rd Ave. Northeast, Conover, N.C. 28601

Filed Sept. 3, 1974, Ser. No. 502,965
Int. Cl. A45f 3/22; A47c 9/10
U.S. Cl. 5—121 5 Claims



1. A compact bed intended for support from a vertical tree trunk, a horizontal railing of a fence, and the like, comprising:
a flat horizontal platform having a top surface, a bottom surface, opposed end edges, a back side edge, and a front side edge;
a plurality of identical longitudinally aligned spaced apart openings disposed adjacent the back edge and including one opening centrally of the back edge with at least one opening near each back edge corner of the platform;
a vertical support bracket having a horizontal flange projecting outwardly therefrom normal thereto and intermediate the ends thereof;
a boss member projecting upwardly from the top surface of the flange member to engage the central opening of the platform to removably mount the platform to the support bracket;
a pair of vertically extending spaced apart slots disposed in the support bracket above the flange member;
a flexible strap passing through the slot and having connecting means associated with the ends thereof for securing the ends of the strap together about a tree trunk and the like to removably retain the support bracket thereto extending vertically along a side surface thereof;
brace means associated with the bottom of the platform and extending downwardly and inwardly therefrom;
a support member associated with the projecting ends of the brace means and adapted to engage a portion of the

supporting tree trunk vertically beneath the supporting bracket; and

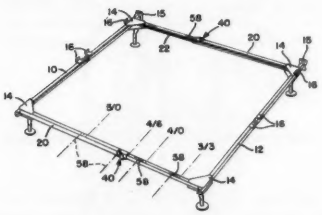
a roof and side wall assembly removably associated with the platform to define a roof cover and side walls and closing the area immediately above the platform to protect an individual sleeping on the platform from the elements of the weather.

3,871,039

BED FRAME

David S. Garceau, and Silas J. Knoke, both of Seymour, Ind., assignors to Lear Siegler, Inc., Seymour, Ind.

Filed May 9, 1974, Ser. No. 468,506
Int. Cl. A47c *19/04*
U.S. Cl. 5—181 **4 Claims**



1. An adjustable bed frame in which a pair of end rails are adjustably interfitted to support varying widths of bedding thereon, and in which said rail pairs comprise interfitted channel-shaped rail sections each having a back wall and a pair of side walls, the improvement in a fastenerless latch mechanism for retaining each of said pairs of rails in pre-determined relation, comprising a double-ended latch member having a generally flat body portion rotatably mounted adjacent the outside surface of the back wall of said outer rail section, said latch member having opposite transversely turned arms positioned in generally overlying relation to the side walls of said outer rail, each of said arms having an arcuately-formed, inwardly extended finger, means in said outer rail side walls defining clearance openings through which said fingers simultaneously move as said latch member is rotated to a locking position, means in said side walls of said inner rail defining a plurality of pairs of openings selectively alignable with said clearance openings to define pre-determined adjusted position in response to telescopic movement of said end rail sections, said opening pairs being positioned to receive said fingers therethrough upon rotation of said latch member to lock said rail sections at a selected said adjusted position, said fingers in said locking position presenting camming surfaces to the side walls of said inner rail sections so that forces tending to move said rail sections telescopically in either direction will present the side walls of the inner section against a camming finger surface thus tending to hold said latch member in its locking position.

3,871,040

APPARATUS FOR HARVESTING FRUIT FROM TREES

Carmelo Marasco, Lecce, Italy, assignor to Ernesto Lendaro, Udine, Italy

Filed May 16, 1974, Ser. No. 470,652
Claims priority, application Italy, May 16, 1973, 17104/73
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 R **8 Claims**

1. Apparatus for harvesting fruit from trees by means of intermittent jets of compressed air, which comprises:

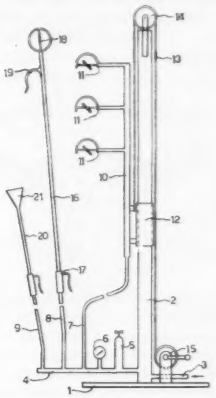
a. a vertically positioned guide member;

b. a blower unit supported by said guide member and slidably attached thereto for vertical displacement therealong;

c. at least one nozzle positioned at the upper extremity of said blower unit for delivering compressed air pulsatingly against the foliage of the tree;

d. means for raising and lowering said blower unit along said guide member;

e. means for holding compressed air delivered by a compressor source;



f. means for controlling the flow of compressed air to said blower unit;

g. means connecting said holding means with said blower unit for fluid communication therebetween; and

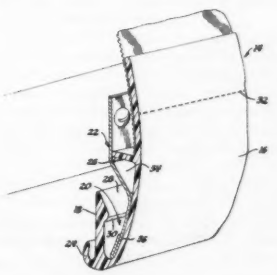
h. means for supporting said guide member in vertical position.

3,871,041

UPHOLSTERY ATTACHMENT HARDWARE

Robert W. Plume, Sterling Heights, Mich., assignor to Travel Products, Inc., Washington, Mich.

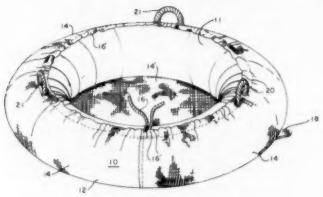
Filed Oct. 4, 1973, Ser. No. 403,686
Int. Cl. A47c *23/00*
U.S. Cl. 5—353.1 **6 Claims**



1. Upholstery attachment hardware for mating engagement with a keeper strip attached to the article to which upholstery is to be applied comprising: a front molding; an interlock finger formed integral with said front molding, said interlock finger and said front molding forming an interlock groove adapted to receive said keeper strip attached to the article to which the upholstery is to be applied; and a locating finger disposed in a confronting relation with said interlock finger on the side of said interlock finger opposite said front molding, said locating finger being adapted to engage the article to which the upholstery is to be applied to provide a predeter-

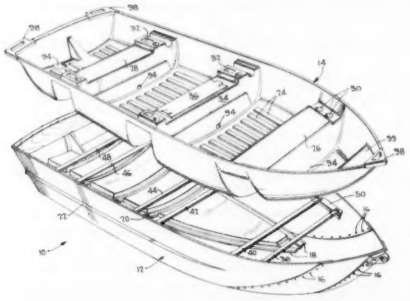
mined spacing of said front molding relative to the article to which the upholstery is to be applied.

3,871,042
INFLATABLE VEHICLE CONSTRUCTION
Gary W. Farmer, 310 W. Ash, Caldwell, Idaho 83605
Continuation-in-part of Ser. No. 310,741, Nov. 30, 1972, abandoned. This application Jan. 20, 1974, Ser. No. 437,279
Int. Cl. B63c *9/04*
U.S. Cl. 9—1 A **5 Claims**



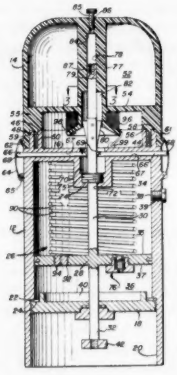
1. In combination with inflatable annular ring, an inflatable vehicle construction comprising a cuff fabricated to conform about the circumference of said ring over a portion of the outside periphery of said ring distally interior of the upper and lower apexes of said ring, a drawcord slidably carried in a suitable cord-carrying means disposed about the upper terminal edge of said cuff, a flexible bottom fastened about the lower terminal edge on the ring-contacting side of said cuff, a tow ring disposed distally from the lower edge of said cuff, and a tie ring secured centrally in the upper side of said bottom engageable with the two rope section which provides means for deforming said ring covered by said vehicle construction into a bow-like configuration and for securing said construction into said configuration.

3,871,043
BOAT STRUCTURE
Samuel L. Davidson; William C. Heidenreich, and Phillip Hunter, all of Monroe, La., assignors to Delhi Manufacturing Company, Delhi, La.
Filed Dec. 5, 1973, Ser. No. 422,157
Int. Cl. B63b *3/09, 3/16*
U.S. Cl. 9—6 **12 Claims**



1. A boat construction comprising, in combination, a hull and a liner therefore each of which has upstanding side wall portions, said liner being smaller than, and having at least a major portion of its side walls fitting within said side walls of said hull, said hull and said liner being formed primarily of materials having different coefficients of thermal expansion, bracing means carried by said side walls of said hull and spanning said hull and supporting at least portions of said liner intermediate said side walls of said liner while permitting said liner to move relative to said hull in response to differences in expansion and contraction resulting from temperature differentials, and connecting means securing portions of said side walls of said liner and said hull, said connecting means also permitting said hull and said liner to move relative to each other in response to differences in expansion and contraction resulting from temperature differentials.

3,871,044
UNDERWATER TIMER AND RELEASE DEVICE
Edwin J. Wedrall, 1170 N. Puente St., Brea, Calif. 92611
Filed Dec. 5, 1973, Ser. No. 421,856
Int. Cl. B63c *7/26*
U.S. Cl. 9—9 **4 Claims**



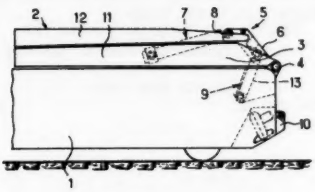
1. A combination timing-and-float-marking device, comprising:
- a cylindrical housing having an upper wall and a removable lower end wall, wherein there is defined an enlarged compartment;
- a buoyant mass releasably attached to one end of said housing;
- means for releasably securing said mass to said housing, wherein said means is disposed therebetween;
- a piston means slidably disposed within said compartment, whereby the movement thereof operates said releasably securing means, said piston means comprising:
- a piston head having a rod secured thereto, one end thereof extending upwardly through said upper wall and downwardly through said lower end wall,
- a valve means disposed in said piston head to permit flow of fluid in one direction therethrough,
- a fluid-flow-regulating means disposed in said piston, whereby fluid flow is metered therethrough for controlled movement of said piston, and
- a biasing means operably disposed within said compartment between said upper wall and said piston head, thereby biasing said piston head in a direction whereby fluid is forced to flow through said regulating means; and

wherein said compartment includes:
- a primary chamber formed in said compartment between said upper wall and said piston head, and
- a secondary chamber formed in said compartment between said lower end wall and said piston, and wherein said valve means comprises a one-way check valve so arranged within said piston head as to permit fluid flow from said primary chamber to said secondary chamber, and wherein said fluid-flow-regulating means permits fluid to flow into said primary chamber from said secondary chamber at a predetermined rate.

3,871,045
LAUNCHER FOR EXTENDIBLE AND RETRACTABLE BRIDGE STRUCTURE

Claude Bouvet, and Michel Eugene Terrien, both of Angers, France, assignors to DPAGA-Bureau des Brevets & Inventions Republic of France, represented by the Minister of State for National Defense, Delegation Ministerielle Pour l'Armement, Paris, France

Filed Aug. 31, 1973, Ser. No. 393,610
Claims priority, application France, Sept. 29, 1972, 72.34301
Int. Cl. E01d *15/14*
U.S. Cl. 14—1 **17 Claims**

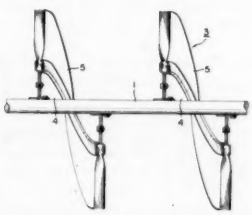


1. In combination, a bridge launcher, a bridge structure articulated at one of its ends on a shaft located on the bridge launcher for movement between a retracted position wherein the bridge structure rests on the bridge launcher and an operative extended position wherein the bridge structure is adapted to bridge a span, a crossbeam articulated on the said shaft and having at least one arm extending away from said shaft, a positioning means including a positioning extendible element interconnecting a first point on the said arm which is spaced away from the shaft to a point on the bridge structure near the end thereof which is articulated on the shaft, said positioning extendible element forming a supporting brace for the bridge structure in the extended position thereof, and a drive means including at least one drive extendible element for operatively interconnecting the bridge launcher and second point on the said arm between the shaft and the said first point thereon, whereby said drive means is operable, when extended, to move the crossbeam and hence also the bridge structure via said positioning extendible element from said retracted position at least to a partially extended position.

3,871,046
POLISHING DEVICE FOR A VEHICLE

Shigeo Takeuchi, Nagoya, Japan, assignor to Takeuchi Tekko Kabushiki Kaisha, Nagoya-shi, Aichi-ken, Japan

Filed May 14, 1973, Ser. No. 360,170
Claims priority, application Japan, July 13, 1972, 47-82801
Int. Cl. B60s *3/06*
U.S. Cl. 15—21 D **1 Claim**

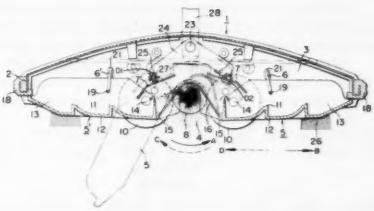


1. A polishing device for a vehicle comprising a rotating shaft, a spiral buff body surroundingly attached to said shaft by means of spiral attaching means radially expanding from the circumferential surface of said shaft, and a pair of swing arms rotatably supporting said shaft between said swing arms, said spiral attaching means comprising a pair of spiral plates both radially expanding from the circumferential surface of said shaft in side-to-side abutting relationship, said plates forming a spiral concave opening outwards along their outer edges for clamping the root side edge of said spiral buff body.

3,871,047
FLOOR CLEANER

Yasuo Kaburaki, and Kiyoshi Kobayashi, both of Nagareyama, Japan, assignors to Hiroshi Hukuba, Nagareyama-shi, Chiba-ken, Japan

Filed Dec. 22, 1972, Ser. No. 317,833
Int. Cl. A47l *11/33*
U.S. Cl. 15—42 **5 Claims**



1. A floor cleaner, comprising:

housing means defining a downwardly opening compartment;

roller means rotatably supported on said housing means and adapted for rolling engagement with a support surface, such as a floor, for movably supporting said housing means thereon;

brush means disposed within said compartment and rotatable in response to rotation of said roller means for sweeping the dust off of said support surface, said brush means including an elongated brush rotatably supported on said housing means and extending transversely across said compartment in a direction substantially perpendicular to the direction in which said housing means is moved during a cleaning operation, said rotating brush having a rotational axis which is substantially parallel to the rotational axes of said roller means;

first and second dust receiver means mounted on said housing means and positioned for receiving therein the dust swept off of said surface by said rotating brush, said first and second dust receiver means each having an edge thereof positioned closely adjacent the periphery of said rotating brush, and said first and second dust receiver means being positioned on substantially diametrically opposite sides of said brush so that dust will be deposited into either said first or second dust receiver means depending on the rotational direction of said brush;

each of said dust receiver means comprising an upwardly opening boxlike tray mounted on said housing means, said tray having one sidewall thereof positioned closely adjacent the periphery of said brush, and one-way means associated with each said dust receiver means for permitting the dust deposited within said receiver means to move in a direction away from said brush in response to inertia caused by the back-and-forth movement of said housing means on said surface, said one-way means tending to prevent the dust within said receiver means from moving back towards said brush;

said one-way means including a sloped wall portion formed on the bottom of said tray and extending upwardly in a direction away from said brush, said sloped wall terminating in a substantially vertical wall which projects downwardly to form an abutment which tends to prevent the dust from moving backwardly towards the brush after the

dust has passed over said sloped wall, said vertical wall being located between said one sidewall and the middle of said tray as measured between the front and rear ends thereof; and

hindering means associated with each of said dust receiver means for preventing the dust deposited therein from moving backwardly out of said dust receiver means so as to again contact said rotating brush, said hindering means including a hindering member positioned over each tray and disposed above said sloped wall in the vicinity of said vertical wall, said hindering member having a plurality of projections which extend downwardly toward the bottom of said tray but are spaced upwardly therefrom to prevent the dust collected within said tray from moving back towards said brush, said projections being spaced from one another in a direction extending transversely across said compartment, the spacing between said projections enabling dust to move therebetween when deposited into said tray by said brush, whereupon the dust as deposited into said tray then contacts the dust previously collected within said tray to form a larger mass which is of substantial transverse width so that said larger mass of dust is prevented by said projections from moving backwardly toward the brush.

3,871,048

BRUSH

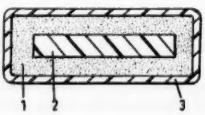
Monty Leigh, Boreham Wood, England, assignor to Leng-Armac Limited, Boreham Wood, Hertfordshire, England

Filed Aug. 16, 1973, Ser. No. 388,917

Claims priority, application United Kingdom, Aug. 18, 1972, 38757/72; Oct. 13, 1972, 47412/72; June 11, 1973, 27645/73

Int. Cl. A46b *3/06, 9/00;* **A46d** *1/08*

U.S. Cl. 15—159 A **18 Claims**



1. A brush head formed by an extruded plastic sheath, a bundle of straight parallel extruded plastic filaments which project from one end portion of said extruded plastics sheath, and a wedge, the portion of the bundle within the sheath completely surrounding said wedge.

3,871,049

WINDOW WIPER ASSEMBLY

Robert E. Workman, Westlake, Ohio, assignor to The B. F. Goodrich Co., New York, N.Y.

Continuation of Ser. No. 9,584, Feb. 9, 1970, abandoned. This application May 17, 1971, Ser. No. 144,245

Int. Cl. B60s *1/46*

U.S. Cl. 15—250.04 **3 Claims**

1. A window cleaning unit for a window movable into and out of a window well, comprising: a single elongated inflatable member, a squeegee carried on said inflatable member, a fluid dispensing passageway extending longitudinally through said inflatable member, said inflatable member having a plurality of longitudinally spaced spray apertures along the length thereof communicating directly with said passageway, a retainer supporting said inflatable member for projecting outwardly said squeegee upon inflation of said passageway in said inflatable member, and pressurizing means connected to said passageway operative to inflate said inflatable member to project the squeegee from noncontacting engagement into contacting engagement with the window surface to be wetted and cleaned.

3,871,050

AUTO WINDSCREEN-WIPER BLADES

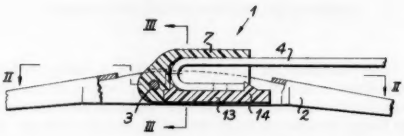
Jacques Baut, 213 boulevard du Souverain, 1160 Brussels, Belgium, and Paul Journee, Chateau de Reilly, 60 Reilly (par Chaumont-en-Vexin), France

Filed Mar. 20, 1973, Ser. No. 343,158

Claims priority, application France, Oct. 31, 1972, 72.38531

Int. Cl. B60s *1/40*

U.S. Cl. 15—250.32 **6 Claims**



1. A device for removably connecting a wiper blade to the arm of a windshield wiper wherein the free end of said arm defines a U-shaped end portion having a relatively short reversely bent leg provided with an end surface, said connecting device comprising:

means pivoted to said wiper blade and defining an open-ended socket means of a size to receive said U-shaped end portion;

that side of said socket engaging said reversely bent leg being resilient and provided with an abutment adjacent the open end of said socket engaging said end surface to releasably retain said arm in said socket; and

the other sides of said socket being relatively stiff and inflexible.

3,871,051

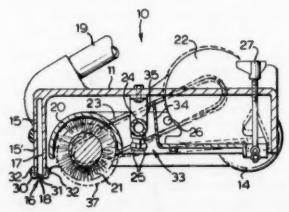
MACHINE FOR CLEANING CARPETS AND THE LIKE

Sidney Wellington Collier, Norval, Ontario, Canada, assignor to Syd W. Collier Co. Ltd., Mississauga, Ontario, Canada

Filed Sept. 12, 1973, Ser. No. 396,547

Int. Cl. A47l *7/00*

U.S. Cl. 15—321 **8 Claims**



4. A machine for cleaning rugs and the like comprising means for applying cleaning fluid to a rug, means for brushing said rug immediately after application of said cleaning fluid, and means for applying vacuum to said rug immediately after said brushing; said means for brushing the rug comprising a motor and a brush which are mounted on an adjustable plat-

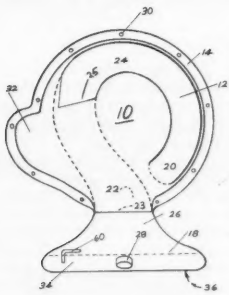
form in spaced relation, the distance between said motor and said brush being constant at all times, irrespective of brush adjustment; said brush being adjustable to the thickness of said rug, while the distance between said means for applying cleaning fluid and the rug surface remains constant, said platform being mounted on said machine to rotate about a horizontal axis, means for rotating said platform a limited distance about said horizontal axis to effect height adjustment of said brush relative to the rug surface and means for securing the platform in the adjusted position.

3,871,052

POWER LAWN MOWER VACUUM ATTACHMENT

Robert C. Luckcuck, 2008 Verdugo Pl., Fullerton, Calif. 92633

Filed Sept. 7, 1973, Ser. No. 395,003
Int. Cl. A47l *9/00*
U.S. Cl. 15—328 **1 Claim**



1. A vacuum attachment for a power lawn mower, comprising:
   a. a cover member adapted to be mounted on the underside of said lawn mower, forming a vacuumed area therebetween;
   b. an air-intake member comprising a spout member having a forwardly-protruding nozzle and an inwardly-extending throat portion integrally connected to said cover, whereby air is drawn therethrough into said vacuumed area; and
   c. an air passage element comprising a trough portion integrally formed within said cover and disposed between said throat portion and said vacuumed area to provide air-flow communication between said air-intake member and said vacuumed area.

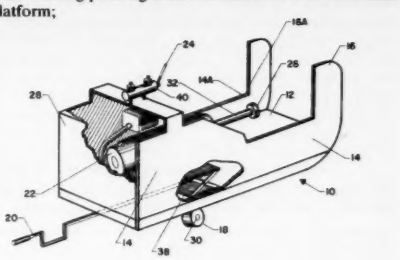
3,871,053

EQUALIZER BEAM BUSHING PRESS

Ed Thornsbury, 3308 S.W. 59th Terrace, Fort Lauderdale, Fla. 33314

Filed June 18, 1973, Ser. No. 371,037
Int. Cl. B23p *19/02*
U.S. Cl. 29—252 **3 Claims**

1. A machine for inserting and removing tandem axle equalizing beam bushings comprising:
   a horizontally disposed rigid planar platform;
   a pair of parallely disposed rigid vertical planar sides, each planar side connected along an opposite edge of said rigid planar platform and rising thereabove, each side having an upper beam supporting edge, each edge having a vertical portion and a horizontal portion adapted to receive a tandem axle beam substantially at the junction of said vertical edge portion and said horizontal edge portion;
   a beam bushing pressing means mounted on said horizontal platform;



   horizontal platform supporting means;
   means connected to said platform and said platform supporting means for raising and lowering said horizontal planar platform.

3,871,054

DOLLY AND METHOD OF USING IT TO HANG A DOOR

Theodore S. Schaefer, 3022 W. Scott Ave., McHenry, Ill. 60050

Filed Mar. 11, 1974, Ser. No. 450,094
Int. Cl. B66f *3/00*
U.S. Cl. 29—267 **6 Claims**

6. A method of hanging a door including the steps of:
   supporting the door on a dolly having a U-shaped frame with a bight portion underlying the door bottom, and having a lever arm extending outwardly from at least one side of the frame;
   wheeling the door to a position adjacent the door frame;
   stepping on the lever arm and causing the U-shaped frame to pivot about the axis of the wheels, thereby raising the bight portion and lifting the door vertically; and
   adjusting the position of the lever arm until the hinge portions on the door align with the hinge portions on the door frame.

3,871,055

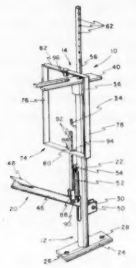
FOOT ACTUATED PRESS

Elwood C. Dail, 328 Snowden St., Tarboro, N.C. 27885

Filed Mar. 20, 1974, Ser. No. 452,983
Int. Cl. B23p *19/04*
U.S. Cl. 29—267 **8 Claims**

1. A foot actuated press assembly adapted to engage a work piece and to exert a pressing force thereagainst, said foot actuated press comprising: a frame structure including an upright cylindrical tube having a bottom horizontal floor plate adapted to be secured to a floor and to support said cylindrical tube in an upright fashion; means associated with said frame structure for supporting said work piece, said means for supporting said work piece extending across said cylindrical tube and including an opening therein, said work piece supporting means further including an extension extending from said upright cylindrical tube and including a cutout therein for receiving a work piece having a shaft extending therefrom

such that when supported the shaft of said work piece extends downwardly through said cutout; a foot actuated pedal means movably mounted to said frame structure; intermediate connecting means movably responsive to the actuation of said foot actuated pedal means for movement relative to said frame structure and including a plunger rod operatively connected to said foot actuated pedal means and disposed interiorly of said cylindrical tube, said plunger rod extending through said opening in said means for supporting said work piece; a work piece engager means associated with said intermediate connecting means for engaging the work piece and exerting a pressing action thereagainst in response to the



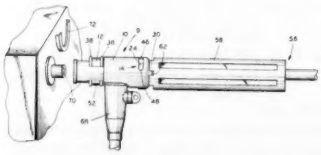
actuation of said foot actuated pedal means; and a secondary connecting structure means for interconnecting said foot actuated pedal means with said work piece engager means when the work piece is of the type having a shaft extending therefrom and the work piece is supported on said extension of said work piece support means, said secondary connecting structure means including an open rectangular frame having a pair of laterally spaced vertical members connected by lower and upper transverse members, said lower transverse members being operatively connected to said foot actuated pedal means by an interconnecting link and said upper transverse member having means for receiving said work piece engager means about the underside thereof.

3,871,056

ELBOW CONNECTOR PULLER

Ellis E. Lyons, Birmingham, Ala., and William F. Turner, Carol Stream, Ill., assignors to Anderson Electric Corporation, Leeds, Ala.

Continuation of Ser. No. 320,029, Jan. 2, 1973, abandoned. This application June 10, 1974, Ser. No. 477,559
Int. Cl. B25b *27/02*
U.S. Cl. 29—283 **10 Claims**



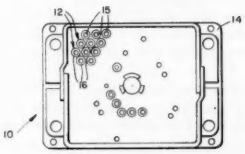
8. An electrical elbow connector puller comprising inner and outer telescoped cylindrical sleeves which are relatively rotatable about a common axis of the sleeves between two relative positions, the sleeves having respective rear end walls, the end wall of the outer sleeve having a central opening, the sleeves having respective axially directed cutaway portions extending inwardly from respective adjacent and forward ends thereof, which cutaway portions, when the sleeves are in one of said relative positions, are in radial alignment and define a slot open at the forward end of the sleeves and having generally parallel side edges extending rearwardly of the sleeves to a rearward edge of the slot whereat the rearward end of the cutaway portions are fully coincident so that the lead end of an elbow connector can be received in the slot and positioned against the rearward edge of the slot while the sleeves remain in said one of said relative positions, one of the sleeves including a single transverse cutaway portion extending substantially normal to and intersecting its axially directed cutaway portion and defining an adjacent wall portion between the transverse cutaway portion and the forward end of said one sleeve, the wall portion providing an interfering barrier at the open forward end of the cutaway portion of the other sleeve when the sleeves are rotated to the other of said relative positions, means for restricting relative longitudinal movement of the sleeves and limiting relative rotation of the sleeves between the two positions, and means for connecting the puller to a pulling rod including an attachment means secured to, and extending axially rearwardly from, the rear wall of the inner sleeve through the central opening at the rearward end of the outer sleeve.

3,871,057

TOOL AND METHOD FOR INSERTION AND REMOVAL OF ELECTRICAL CONNECTOR INTERFACE SEALS

Norbert L. Moulin, Placentia, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 25, 1973, Ser. No. 363,902
Int. Cl. B23p *19/02*
U.S. Cl. 29—427 **11 Claims**



1. A tool for inserting an individual tubular interface seal on and removing the seal from an electrical pin contact and a bore in a connector body comprising:

a shaft having a body portion of first diameter terminated at each end by a seal insertion end and a seal removal end, said seal insertion end comprising a tubular terminating portion of diameter less than the first diameter for frictional engagement with an internal bore in the seal, and first bore means extending through said first tubular terminating portion into said shaft body, said first bore means having a depth sufficient to limit axial insertion of the pin contact therein,

said seal removal end comprising a tubular terminating portion of diameter less than the first diameter and terminating in a nipple of diameter substantially equal to the first diameter for enabling a latching engagement with the internal bore in the seal, and second bore means extending through said nipple and said second tubular terminating portion into said shaft body, said second bore means having a depth sufficient to limit axial insertion of the pin contact therein, and

said body portion having a shank of diameter less than the first diameter; and

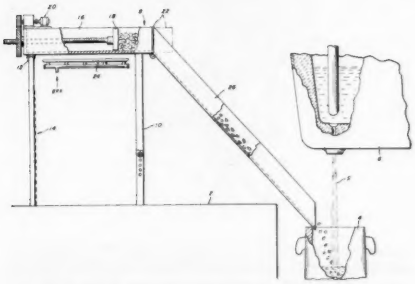
a tube slidably disposed over said shaft and movable towards and away from said seal removal end in covering and uncovering relationship with respect to said nipple for maintaining the seal latching engagement in the covering relationship, said tube having an inturned flange for containment solely within said body portion shank and for preventing disengagement of said tube from said shaft.

3,871,058

ROLLED STEEL PRODUCTS AND A METHOD OF MAKING THE SAME

Henry J. Wallace, 570 Squaw Run Road, Fox Chapel Borough, Pa. 15238

Filed Oct. 5, 1973, Ser. No. 403,842
Int. Cl. B23p 17/04
U.S. Cl. 29—403 8 Claims



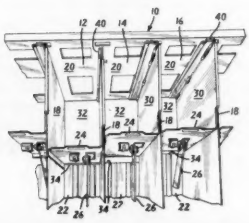
1. The method of making a rolled metal product which comprises providing molten metal of a known analysis in a container, providing scrap metal of an analysis approaching that of the molten metal, cleaning said scrap, heating said scrap to a temperature sufficient to remove all moisture therefrom, simultaneously charging all the scrap and molten metal by pouring said molten metal into an ingot mold while simultaneously feeding said scrap in small pieces at a controlled rate into said mold in such an amount that the majority thereof will not melt, permitting said mixture of scrap and molten metal to solidify in said mold into an ingot, heating said ingot to a rolling temperature, and then rolling said ingot to substantially reduce its cross section.

3,871,059

CONVERSION OF CIGARETTE VENDING MACHINES TO HOLD OUTSIZED CIGARETTE PACKAGES

John E. Goldenstein, Gretna, Nebr., assignor to Philip Morris Incorporated, New York, N.Y.

Filed June 21, 1974, Ser. No. 481,743
Int. Cl. B23p 19/02
U.S. Cl. 29—427 4 Claims



1. In a method for modifying a cigarette vending machine column designed for holding cigarette packages of a first predetermined length in vertical stacked superposition to adapt said column for holding and dispensing cigarettes packages of a second greater predetermined length, said vending machine column being defined by spaced apart vertical side walls, a front vertical wall extending between said side walls, a bottom wall having an opening extending rearwardly from said front wall through which opening the packages must pass for dispensing of same from said machine, the length of said bottom wall opening being substantially equal to said first predetermined article length, the rearmost extent of said opening being defined by an edge on said bottom wall disposed transversely of said side walls, there being a normally forwardly biased vertical rear wall extending between said side walls and slidable on said bottom wall,

comprising removing a section of the bottom wall along a predetermined removal course rearwardly from said edge to elongate said bottom wall opening to a length substantially equal to said second predetermined package length, an applying stopping force to said rear wall to prevent biased travel of said rear wall forwardly of the rearmost extent of said elongated bottom wall opening, the improvement wherein

said section is removed from said bottom wall by positioning a punch at one side of said bottom wall, and a complemental die element at the other side of said wall in full bearing contact with said bottom wall at least at portions thereof lying adjacent said removal course, and

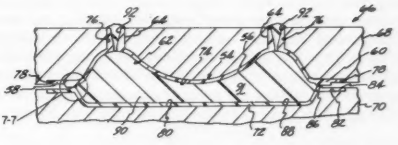
progressively shearing said wall along said removal course by drawing said punch therethrough to remove said section.

3,871,060

METHOD OF CONSTRUCTING MOLD FOR FORMING PLASTIC FOAM PARTS

Michael Ladney, Jr., 18125 E. Ten Mile Rd., Grosse Pointe Shores, Mich. 48236

Continuation of Ser. No. 213,244, Dec. 29, 1971, abandoned.
This application Jan. 30, 1974, Ser. No. 437,792
Int. Cl. B23p 19/00
U.S. Cl. 29—428 3 Claims

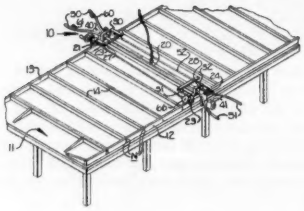


1. A method of constructing a mold having a cavity in which a plastic foam part is adapted to be molded, said mold including a pair of separable mold sections, each of which is adapted to receive an injection molded cavity-forming liner which, when the mold sections are closed with one another, cooperate to define said mold cavity, comprising the steps of: forming two pair of metal dies, each pair having molding surfaces which correspond with a half section of the exterior surfaces of the foam part to be molded; utilizing each pair of said metal dies to form an injection molding cavity defined by the respective molding surfaces of said two metal dies; subjecting a thermoplastic synthetic resin material to sufficient heat and pressure to plasticize the same and injection molding said material in said injection molding cavity of each pair of said metal dies to form a pair of injection molded thermoplastic liners for said foam mold sections each having an exterior surface contour formed by the molding surface of its respective pair of metal dies which is the reverse of the external surface contour of the two opposite sides of the plastic foam part to be molded; removing said injection molded liners from said pairs of metal dies; and inserting the two injection molded liners in opposed relation, one in each of said separable mold sections such that when the mold sections are closed said exterior surface contours of the two liners cooperate to define a foam molding cavity which corresponds in size, shape and contour to the size, shape and contour of the foam part to be molded therein.

3,871,061
WALL FRAME CONSTRUCTION METHOD

William D. Abernathy, Route 2, Vale, N.C. 28168

Division of Ser. No. 115,463, Feb. 16, 1971, Pat. No. 3,734,376. This application Mar. 12, 1973, Ser. No. 340,368
Int. Cl. B23p 19/00
U.S. Cl. 29—431 4 Claims



1. In the construction of rough wall frames for buildings in which a plurality of studs are arranged in horizontal, parallel spaced relation and an elongate plate and an elongate sole are arranged in horizontal, parallel spaced relation perpendicular to the studs and extending adjacent the opposite ends of the studs, a method comprising the steps of providing spaced clamping means and spaced nailer means movable together on the plate and the sole; engaging with said clamping means oppositely directed outer faces of the plate and sole in areas generally aligned with a particular stud to be nailed for restraining the plate, sole and stud in the arranged positions during nailing; driving nails with said nailer means through the plate and sole into the ends of the particular stud for securing the plate, sole and stud together into a wall frame; progressively moving the areas of engagement of said clamping means with the plate and sole outer faces along the plate and sole and into general alignment with another stud to be nailed and while maintaining engagement with the plate and sole; and repeating the steps of driving nails with said nailer means and progressively moving the areas of engagement until all of the arranged studs have been secured into the wall frame.

3,871,062
METHOD FOR TRAVERSING A WORKPIECE WITH A WORKING HEAD

Motoharu Adachi; Shunichi Nishizawa; Michiyasu Ishida; Takashi Kaneko, all of Kyoto, and Tasushi Yonenaga, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1974, Ser. No. 431,722
Claims priority, application Japan, Feb. 2, 1973, 48-12856
Int. Cl. B23k 29/00
U.S. Cl. 29—470 1 Claim

1. A process for performing a task with a work head on a workpiece along a line which proceeds through a corner, comprising:

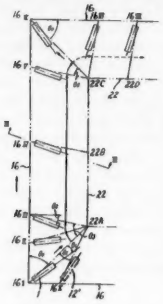
aiming the work head at a predetermined angle toward said line at a point upstream of the corner and mounting the work head for movement along a path laterally spaced from the line by a fixed distance, said path having a corner equating to the corner of said line;

translating the work head along the path toward the corner of the line, maintaining the aim of the work head at continuously successive points along the line until the corner of the path is reached; then

simultaneously:

a. rotating the work head about said corner of the path so as to bear a like relation to said line downstream of said corner of the line as said work head bore to said line upstream of said corner of the line, and

b. indexing the work head radially with respect to said corner of the path to maintain constant the distance between the work head and the workpiece along said line while passing through the corner; and

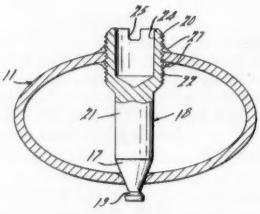


translating the work head along the path downstream of the corner of the path, maintaining the aim of the work head at continuously successive points along the line.

3,871,063
METHOD OF JOINING A FUEL SPRAY NOZZLE TO A FUEL MANIFOLD

Robert M. Halvorsen, Birmingham, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Division of Ser. No. 363,055, May 23, 1973, Pat. No. 3,827,638. This application Jan. 18, 1974, Ser. No. 434,427
Int. Cl. B23k 31/02
U.S. Cl. 29—470.5 2 Claims



1. A method for mounting a fuel spray nozzle pintle in a manifold of the type having an elliptical cross section with an orifice in one wide wall thereof, comprising the steps of threadably mounting one end of said pintle directly into the opposite wall of the manifold, rotatably preadjusting the pintle and brazing it to the manifold.

3,871,064
MOIRE FRINGE PATTERN WITH THERMAL MATCHING TO ALUMINUM OR OTHER MATERIALS

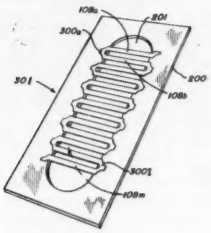
George Frederick Schrader, Lakewood, Calif., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Mar. 25, 1974, Ser. No. 454,351
Int. Cl. G02b 27/00
U.S. Cl. 29—475 5 Claims

1. A method for forming an optical grating having the thermal expansion characteristics of a preselected material, comprising the steps of

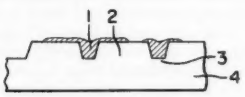
a. forming a plate of the preselected material having a flat surface with a slot having first and second sides piercing the plate;

b. forming a thin flat sheet of a material suitable for forming the bars of the grating;
c. forming slits creating therebetween in the thin flat sheet bars which form the desired grating and which are longer than the distance between the first and seconds sides of the slot but do not extend to the edge of the sheet;



d. bonding the sheet to the plate in a position causing each slit in the sheet to extend past the first and second sides of the slot in the plate; and
e. removing portions of the sheet connections each end of each bar from an end of at least one adjacent bar.

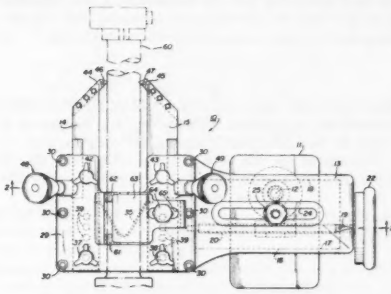
3,871,065
THERMAL PRINTING PROCESS
Yoshimichi Iomiyama, Osaka; Takashi Yamahata, Yamatokohriyama, and Tomoya Yasuda, Kyoto, all of Japan, assignors to General Company Limited, Osaka-shi, Japan
Filed Aug. 2, 1972, Ser. No. 277,476
Int. Cl. B41m *5/18*
U.S. Cl. 117—36.8 **3 Claims**



1. In a thermal printing process for forming an image on a heat-sensitive recording sheet composed of a support having superposed thereon a heat-sensitive layer which is composed of a heat-sensitive composition dispersed in a binder therefor, said process comprising contacting a thermally-heated print head with the surface of the heat-sensitive layer to form a printed image thereon, the improvement comprising eliminating exfoliation of the heat-sensitive layer from the support by employing, as the binder, a member selected from the group consisting of methyl cellulose and acetylcellulose having a melting point of not lower than 180°C.

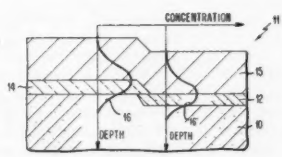
3,871,066
COMBINED CUTTER AND GRINDER ATTACHMENT FOR LATHE
Wallace F. Mitchell, Mettawa, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.
Filed Feb. 7, 1974, Ser. No. 440,587
Int. Cl. B23p *23/00*; **B23b** *25/00*, *5/02*
U.S. Cl. 29—560 **7 Claims**

1. A cutter and grinder attachment for a lathe having
a base and a workpiece supporting spindle rotatably mounted to said base, the combination comprising
a base member adapted to be mounted to the base of said lathe for controlled movement toward and away from said spindle,
a tool holding carriage slidably mounted to said base member for rectilinear movement in a direction parallel to the axis of said spindle,
a pair of tool bars each having means thereon for receiving a cutting tool,
said carriage having coplanar upper surfaces on which planar surfaces of said tool bars are supported,
first and second adjustable pivot means depending from said fixture into respective recesses in the tops of said tool bars disposed on said planar surfaces of said fixture,



spring means interposed between said tool bars for biasing said cutting tools in opposite directions away from a workpiece carried by said spindle,
depth of cut adjustment means carried by said carriage for respectively pivoting said tool bars against the force of said spring,
a saddle on said carriage positioned above and between said coplanar surfaces,
a saddle clamp on said carriage positioned above said saddle for clamping the quill of a grinder in said saddle, and
a lead screw threadedly connected between said carriage and said base member for controllably moving said fixture parallel to said spindle.

3,871,067
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE
E. Hal Bogardus, Poughkeepsie; Peter P. Peressini, Wappingers Falls, and Timothy M. Reith, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 29, 1973, Ser. No. 375,278
Int. Cl. H01l *7/00*
U.S. Cl. 29—571 **14 Claims**



1. A method of manufacturing a semiconductor device having a substrate of a semiconductor material with an insulating layer thereon and a metal film overlying the insulating layer and in contact with at least one portion of the substrate to form an electrode layer including the steps of implanting ions of the semiconductor material into the metal film to form a concentration profile of the implanted ions having a peak, selecting the maximum temperature to which the metal film is

to be subjected during further processing, selecting the dosage of the ions to produce a per cent by weight of the semiconductor material in one material of the metal film that is greater than the per cent by weight of solid solubility of the semiconductor material in the one material of the metal film at the maximum temperature to which the metal film is to be subjected during further processing to prevent the one material of the metal film from diffusing into the semiconductor material during further processing at a temperature no greater than the maximum temperature, and controlling the energy level of the ions to position the peak of the profile of the implanted ions no deeper than the interfaces of the metal film with the insulating layer and the metal film with the substrate.

3,871,068

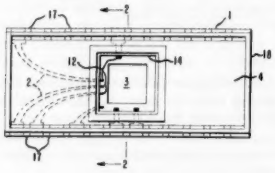
PROCESS FOR PACKAGING A SEMICONDUCTOR CHIP

Charles Lawrence Booth, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 354,129, April 24, 1973, Pat. No. 3,820,152. This application Feb. 4, 1974, Ser. No. 439,642

Int. Cl. B01j *17/00*

U.S. Cl. 29—590 **3 Claims**



1. In a process for packaging a semiconductor chip in a package comprising a substrate having conductor patterns thereon and conductor pads connected to said conductor pattern, the improvement comprising the steps of applying a fugitive shorting bar or strip to said substrate and overlaying said conductor pads, inserting said semiconductor chip in said package and connecting said chip to said conductor pattern, and removing said shorting bar by solder leaching while soldering leads to said pads.

3,871,069

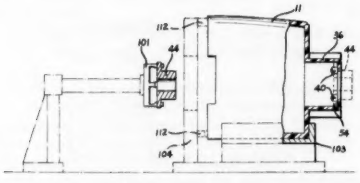
METHOD OF ASSEMBLING AN ELECTRIC MOTOR DEVICE AND HEAT SINK

Dale Christian Grieb, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 27, 1973, Ser. No. 391,530

Int. Cl. H02k *15/00*

U.S. Cl. 29—596 **5 Claims**



1. The method of producing an assembled metal bearing support and heat sink, and electric motor housing, comprising the steps of: selecting an electric motor housing constructed at least in part of a thermoplastic material and having deformable means formed integral therewith, placing said bearing support and heat sink on said deformable means, deforming said deformable means into retaining engagement with said bearing support and heat sink, accurately locating said assembled motor housing and bearing support and heat sink by means engageable with said motor housing, and machining a bearing bore in said bearing support and heat sink in accurate relation to said motor housing.

3,871,070

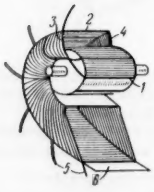
METHOD FOR MAKING WINDING OF SMOOTH-CORE ARMATURE

Vasily Mikhailovich Kazansky, prospekt Karla Marxa 35, kv. 37; Alexei Grigorievich Epifantsev, ulitsa Moskovskaya 85, both of Novosibirsk; Vladimir Lavrentievich Roschektaev, Mikroraion 6, kv. 10, Berdsk Novosibirskoi oblast, and Jury Adamovich Kramer, prospekt Dzerzhinskogo, 23, kv. 54, Novosibirsk, all of U.S.S.R.

Filed Sept. 14, 1973, Ser. No. 397,382

Int. Cl. H02k *15/04*

U.S. Cl. 29—598 **4 Claims**



1. A method of making a winding for a smooth-core armature for fractional horse-power commutator machines; comprising winding a continuous length of a conductor on a former to form a winding blank having active and inactive conductor portions while simultaneously tapping said winding blank; partitioning said winding blank length on said former into four parts of respectively two active and two inactive conductor portions by attaching two equally wide strips of an adhesive insulating material to said blank so as to longitudinally extend along said winding blank on said former; removing said winding blank from the former; and arranging said winding blank on a cylindrical frame by winding one of said strips about the cylindrical surface thereof while shifting the conductor portion attached to the other strip relative to the conductor portion attached to the first mentioned strip by one winding pitch to thereby form an armature winding and to also shape the ends of the winding for fixing the latter on said frame.

3,871,071

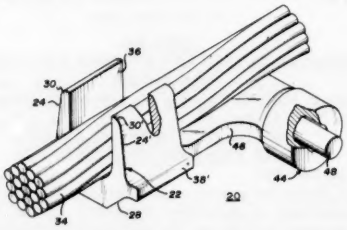
METHOD OF FORMING AN ELECTRICAL CONNECTION

Albert Michael Luongo, Edison, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Sept. 24, 1973, Ser. No. 400,223

Int. Cl. H01r *43/00*

U.S. Cl. 29—628 **4 Claims**



1. A method of forming an electrical connection comprising the steps of: providing a connector having a conductor engag-

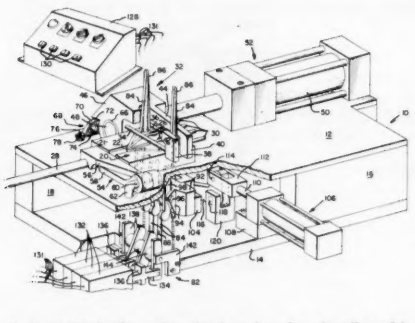
ing body member formed of malleable metallic material and having an inner surface, an outer surface, a conductor receiving cavity defined by said inner surface and extending longitudinally through said body member, and a pair of symmetrically formed rib portions lying in a common plane extending lengthwise on opposite sides of said body member along said outer surface thereof; placing a selective length of a conductor within said conductor receiving cavity; providing a die set reciprocatingly operable along axis and having complementary die cavities selectively shaped to impart a predetermined external contour to said body member and mating recessed portions disposed outside of the perimeter of said die cavities and selectively sized to provide clearance about said rib portions; orienting said body member in a first position within said die set so that said rib portions are disposed in a plane generally normal to the operating axis of said die set and are aligned generally coincident with said recesses; then operating said die set to radially compress said body member about said conductor along a given axis oriented generally normal to the plane of said rib portions while providing a clearance about said rib portions; then selectively angularly rotating said body member about its longitudinal axis to a second position within said die set so that said rib portions are out of coincidence with said die set recessed portions and engagable by said die cavities; and then operating said die set to further compress said body member about said conductor and compact said rib portions into the remaining material of said body member.

3,871,072

METHOD AND APPARATUS FOR VARYING THE RELATIVE LENGTH OF A PLURALITY OF LEADS BY FORMING BIGHTS IN SELECTED LEADS

Kenneth Foster Folk, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 12, 1973, Ser. No. 424,133
Int. Cl. H01r *43/00*
U.S. Cl. 29—628 **18 Claims**



1. A method of varying the lengths of a plurality of leads having sections which extend away from a portion of the leads which are held in fixed relationship to each other, comprising the steps of:

providing an apparatus including a template having a plurality of grooves having spaced apart first and second portions;

positioning said sections of said plurality of leads in said plurality of grooves with the sections extending between said first and second portions and with the held portion of said leads being disposed adjacent to the second portion of said grooves; and

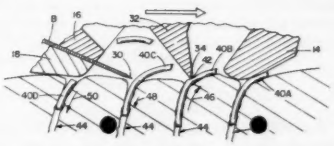
varying the overall length of said sections of selected leads by engaging an intermediate portion of said sections of said selected leads and forming a bight in said intermediate portion between the first and second portions of the grooves while maintaining the sections in said first portions of the grooves.

3,871,073

SHAVING SYSTEM WITH A FIXED EDGE BETWEEN THE BLADE EDGE AND THE GUARD

Warren I. Nissen, Topsfield, and Roger L. Perry, Lynnfield Center, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Nov. 17, 1972, Ser. No. 307,457
Int. Cl. B26b *21/06, 21/22*
U.S. Cl. 30—34.2 **14 Claims**



1. A shaving system comprising:

molded plastic structure for supporting a cutting edge member that has a cutting edge,

structure for positioning the cutting edge member so that its cutting edge is disposed along a predetermined line,

molded plastic skin engaging structure positioned forwardly of and extending generally parallel to said predetermined line, and

supplemental molded plastic structure integral with said supporting structure and said skin engaging structure fixed in position between said skin engaging structure and said predetermined line; and spaced from both said supporting structure and said skin engaging structure so that an open slot is provided on either side of said supplemental structure; said supplemental structure having a hair engaging edge portion disposed parallel to said predetermined line, said hair engaging edge portion having an effective radius in the range of 2–50 microns such that in the course of a normal shaving stroke said edge portion engages hair elements and produces localized distortion in those engaged hair elements to exert a grasping effect on the individual engaged hair elements which pulls them outwardly from their hair follicles as the shaving system is moved over the skin surface in a shaving stroke.

11. A shaving system comprising:

first and second blade members, each said blade member having a cutting edge;

structure for supporting said first and second blade members in symmetrical, opposed relation so that each cutting edge is disposed along a predetermined line;

supplemental structure integral with said supporting structure, fixed in position between said cutting edges and spaced from said supporting structure so that an open slot is provided on either side of said supplemental structure; said supplemental structure having first and second hair engaging edge portions disposed parallel to said cutting edges, each said hair engaging edge portion having an effective dimension relative to the dimension of hair elements to be shaved such that in the course of a normal shaving stroke said edge portion engages hair elements and produces localized distortion in those engaged hair elements to exert a grasping effect on the individual engaged hair elements which pulls them outwardly from their hair follicles as the shaving system is moved over the skin surface in a shaving stroke,

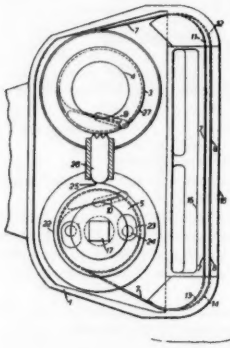
each said cutting edge and the hair engaging edge portion further from that cutting edge defining a plane,

the hair engaging edge portion nearer that cutting being located in the range of −20 to +50 microns perpendicular distance from said plane, and each said blade member being disposed at an angle in the range of 20°–32° to the plane defined by it and the further hair engaging edge portion.

3,871,074
PLURAL BLADE STRIP MAGAZINE WITH BLADE STRIP TENSIONING MECHANISM

Edward E. Pomfret, Newbury, and Norman C. Welsh, Bradfield, both of England, assignors to The Gillette Company, Boston, Mass.

Filed Oct. 29, 1973, Ser. No. 410,394
Claims priority, application United Kingdom, Oct. 30, 1972, 50002/72
Int. Cl. B26b 21/26
U.S. Cl. 30—40.1 5 Claims



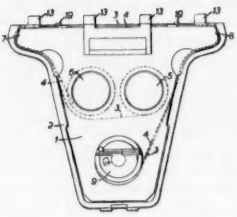
1. A safety razor blade magazine comprising two elongated blade strips, each having the portion adjacent one end thereof wound upon itself to form a storage coil, rotatable take-up means to which the other end of each blade strip is secured and upon which it can be wound to form a take-up coil, means defining a path of travel for the strips from the storage coil to the take-up coil, said path including a section along which a length of each blade strip is exposed for shaving use, the lengths of the respective blade strips which are exposed for use lying parallel to one another in such relationship that when used for shaving their cutting edges will follow one another over the surface to be shaved, said path-defining means being such that the said length of the blade strip is supported at its ends only, the intermediate portion thereof being left otherwise free and unsupported, means for holding the said lengths of the blade strips under longitudinal tension sufficient to give it the degree of rigidity required for use in shaving, and common means for rotating the take-up means of both blade strips.

3,871,075
SAFETY RAZOR WITH A PLURAL STRIP BLADE MAGAZINE

Harry Pentney, Spencer's Wood near Reading, England, assignor to The Gillette Company, Boston, Mass.

Filed Dec. 7, 1973, Ser. No. 422,730
Claims priority, application United Kingdom, Dec. 12, 1972, 52749/72
Int. Cl. B26b 21/26, 21/22
U.S. Cl. 30—40.1 10 Claims

1. A safety razor blade magazine comprising two elongated blade strips, each strip having the portion adjacent one end thereof wound upon itself to form a storage coil, rotatable take-up means to which the other ends of the two blade strips are secured and upon which they can be wound up, means defining paths of travel for the two strips from the respective storage coils to the take-up means, each of said paths including a section along which a length of the respective blade strip is exposed for shaving use, said path-defining means being such that the said lengths of the two blade strips are disposed in parallel planes with their respective cutting edges parallel and in staggered relationship to one another, so that the cutting edges of the two blade strips can both engage the skin to

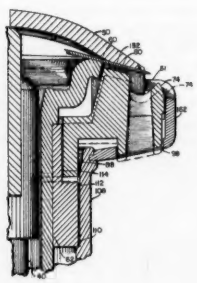


be shaved and will follow one another in tandem relationship during the shaving operation.

3,871,076
RAZOR HAVING A STATIONARY GUARD AND AN AXIALLY SHIFTABLE GUARD

Roger L. Perry, Lynnfield Center, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Nov. 19, 1973, Ser. No. 417,468
Int. Cl. B26b 21/32
U.S. Cl. 30—60.5 15 Claims

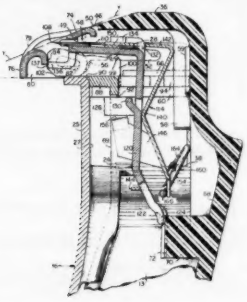


1. A safety razor comprising a tubular handle, blade support means to position a razor blade in shaving position, adjustable guard means positioned below said blade support means, the axial position of said adjustable guard means defining a shaving geometry, fixed guard means lateral to and below said adjustable guard means, said fixed guard means held in fixed relation to said handle, adjustment receiver means housed in said handle, said receiver means rigidly connected to said adjustable guard means, a rotatable actuating member housed in said handle, said actuating member mating with said receiver means to move said receiver means when said actuating member is rotated and thereby adjust the axial position of said adjustable guard means, said tubular handle having a side wall, an opening in said side wall extending around less than the full perimeter of said handle, and a control grip for rotating said actuating member, said control grip extending outwardly from said handle through said opening.

3,871,077
RAZOR WITH MOVABLE GUARD AND CONCURRENTLY MOVABLE BLADE PLATFORM

Warren I. Nissen, Topsfield, and Roger L. Perry, Lynnfield, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Apr. 30, 1973, Ser. No. 355,307
Int. Cl. B26b *21/24*
U.S. Cl. 30—63 18 Claims

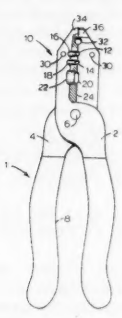


10. A safety razor comprising body structure,
blade support structure disposed in said body structure including a surface adapted to support a blade and being movable as a unit relative to said body structure,
biasing means in engagement with said body structure and exerting a force on said support structure, and
guard structure, said guard structure being movable relative to said blade support structure to change the blade tangent angle of the shaving geometry and concurrently moving said blade support structure against the force of said biasing means to maintain substantially constant cutting edge exposure.

3,871,078
WIRE INSULATION STRIPPER

Robert Ogle, 27221 Calle Del Cid, Mission Viejo, Calif. 92675

Filed Mar. 12, 1973, Ser. No. 340,024
Int. Cl. H02g *1/12*
U.S. Cl. 30—90.1 6 Claims

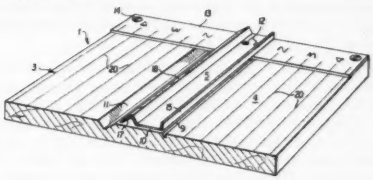


1. A wire stripper hand tool apparatus comprising a first integrally connected flat jaw and handle element and a second integrally connected flat jaw and handle element of substantially uniform thickness and pin means joining the two elements at complementary points between the jaw and handles in a scissors-like arrangement, the jaws closely overlapping in side-by-side arrangement as in the form of scissors, each jaw having an inward facing and complementary elongated concave depression with curved ends and a straight central portion in opposed surfaces of the jaw, and the jaw further having paired opposed semicircular complementary depressions, at least one of the jaws has a sloping surface extending outward from the elongated depressions and the semi-circular depressions, thereby forming sharp edges at the elongated concave depression and the semicircular depressions, and further comprising complementary oppositely inward bent abutment means on the jaws remote from the pin means for preventing overtravel of the jaws when overlapping, thereby preventing closing of the openings in the jaws, whereby the jaws cut and strip an outer sheath and subsequently cut and strip paired insulated wires within the sheath simultaneously.

3,871,079
CUTTING GUIDE AND BOARD ASSEMBLY

Robert L. Magee, 401 W. Lake Rd., Hammondsport, N.Y. 14840

Filed Aug. 13, 1973, Ser. No. 387,659
Int. Cl. B26b *29/00*; B26d *7/02*
U.S. Cl. 30—294 7 Claims



1. A cutting guide and board assembly comprising a grooved board and a straight guide element, said element being secured to opposite sides of said board and extending across the upper surface of smae, said board having a vertical groove and a beveled groove in the upper surface of said board, said grooves extending parallel to one another in spaced apart relationship, said guide element being an elongated angled flexible bar of single-piece construction having a beveled edge and a straight edge on the opposite longitudinal sides of said bar and in registered alignment with said beveled groove and said vertical groove respectively, said straight edge being an upwardly bent portion having an upright vertical surface that extends normal to the upper surface of said board, said beveled edge including an angular projection that comprises an upwardly bent angled portion followed by a downwardly bent angled portion that extends upwardly with respect to said board, said downwardly bent angled portion providing an angled side that affords a guide for a cutting member, squaring means at each of said opposite sides of the board and said guide bar being secured to the opposite, sides to bridge said upper surface leaving a space between said surface and the bottom of said bar, whereby sheet and board material can be inserted in said space below said bar and manually cut using said grooves and the edges of said longitudinal sides as cooperating guides.

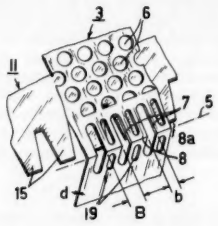
3,871,080
CUTTER FOILS FOR DRY SHAVING APPARATUS

Gerhard Heyek, Graz, Austria, assignor to Famulus Elektrogerate Gesellschaft m.b.H., Graz, Austria

Filed Feb. 26, 1973, Ser. No. 335,869
Claims priority, application Austria, Feb. 28, 1972, 1605/72
Int. Cl. B26b *19/04*
U.S. Cl. 30—346.51 4 Claims

1. A cutter foil for dry shaving apparatus, produced by electro-deposition, and comprising a main portion in which is an area of perforation and an edge zone joined to the main portion by a fold defining an apex extending longitudinally of the foil, a plurality of slots extending across the apex, a cutter

comb constituted by bars extending across the apex and each defined by a respective portion of the foil extending between adjacent slots, the breadths of the bars being greater than the breadths of the slots, and the bars containing perforations located primarily in the area extending between the slots,

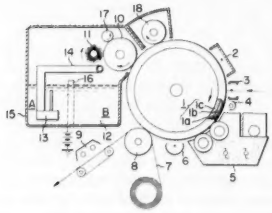


which area is bounded by the upper and lower extents of the slots, said perforations serving to enhance the thickness of the foil produced by electro-deposition in the region of the bars, the perforations in the bars being clear of a zone adjacent to the apex, whereby in each bar the foil is continuous across the width of the bar adjacent to the apex.

3,871,081
CLEANING EQUIPMENT FOR ELECTROPHOTOGRAPHY

Shozo Inoue, and Akira Kurahashi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 7, 1970, Ser. No. 52,926
Claims priority, application Japan, July 14, 1969, 44-67249[U]; July 14, 1969, 44-67251[U]; July 14, 1969, 44-67252[U]; July 14, 1969, 44-67253[U]
Int. Cl. A46b *15/00*
U.S. Cl. 15—256.51 **6 Claims**

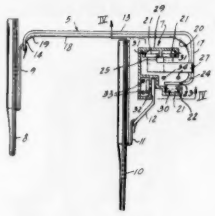


1. Cleaning equipment for use in an electrophotographic apparatus of the transferring type wherein an electrostatic latent image is formed on a photosensitive member and developed and then the developed image is transferred to a transferring material and, thereafter, the residual toner on the surface of the photosensitive member is cleaned off the repetitive use, said equipment comprising means for supplying a cleaning solution and means for cleaning a photosensitive member by rubbing which is positioned between a transferred process and a charging process to effect said cleaning prior to charging, said means for cleaning a photosensitive member by rubbing comprising a roller and an auxiliary cleaning member which is contacted with said roller so as to eliminate the toner adhering thereto, and said means for supplying a cleaning solution being positioned to apply the cleaning solution in the proximity of the contact between said roller and said auxiliary cleaning member.

3,871,082
COMBINATION DRAPERY SUPPORT

August S. Pflum, 5111 S. Rockwell, Chicago, Ill. 60632

Filed July 5, 1972, Ser. No. 269,163
Int. Cl. E05d *13/02*
U.S. Cl. 16—87.2 **7 Claims**



7. An assembly for supporting an over drape in front of an under drape, comprising:

a drapery bar having along a rear side thereof vertically spaced track means comprising downwardly opening upper track means and upwardly opening lower track means;

both of said upper and lower track means having spaced front and rear vertical side walls defining grooves therebetween;

a slide having an elongated arm closely overlying said bar and including a front end portion for supporting an over drape and a rear end portion having a flange depending at the rear side of the bar and provided with forwardly extending projection means between said track grooves; first antifriction slide means carried by said forwardly extending projection means engaging in running relation with said downwardly opening upper track means;

second antifriction slide means carried by said projection means and engaging in running relation with said upwardly opening lower track means;

all of said antifriction slide means riding between and being engageable with the respective vertical groove walls of said track means in running therealong;

said first slide means engaging in said downwardly opening upper track means at substantially spaced respective opposite sides of the longitudinal axis of said arm; and

said upwardly opening lower track means having an upwardly facing rail surface between the groove walls thereof for engagement by said second slide means;

whereby the slide means support the arm in stabilized running spaced relation over the top of said bar with the front end portion of the arm extending forwardly from the bar to support the over drape.

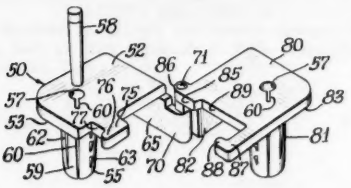
3,871,083
FOLDING DOOR HARDWARE

Lester L. Smith, 230 W. Monroe St., Suites 2040, Tucson, Ariz. 60606

Filed Dec. 6, 1973, Ser. No. 422,321
Int. Cl. E05d *5/02*
U.S. Cl. 16—159 **13 Claims**

1. For use in guiding and hingedly interconnecting adjacent panels in folding door installation and the like, a hardware assembly comprising: a pair of molded members adapted to be cooperatingly mounted on adjacent panels, each said member having a body portion formed with a planar guide surface engagable with a planar surface of a said panel on which its associated said member is mounted, a genrally culindrical radially flexible plug portion formed integrally with said body portion and extending perpendicularly outward of said guide surface thereon, said plug portion having externally projecting barbs and a central axial opening extending therethrough and said body portion; said plug portion being insertable into a

cylindrical mounting socket formed inwardly of said planar surface of said panel, and tapered pin means insertable through said body portion into said axial opening for radially



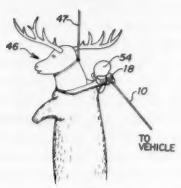
expanding said plug portion in said socket thereby to securely set said barbs and anchor its said associated member to said panel.

3,871,084

DEER SKINNING APPARATUS AND METHOD OF USING SAME

Henry A. Carrington, 415 Gettysburg Rd., San Antonia, Tex. 78228, and Robert O. Kruse, 8111 Glenscot, Houston, Tex. 77017

Filed Oct. 12, 1973, Ser. No. 405,885
Int. Cl. A22b *5/16*
U.S. Cl. 17—21 **6 Claims**



1. An apparatus for removing the skin from an animal comprising:

an elongate flexible member;

a rigid anchor block having rounded edges has such shape and dimensions that a pouch may be formed from the skin of an animal by folding over said block;

a rigid loop support member having first and second aperatures spaced apart by a curved cradle surface a first end portion of said flexible member extending through said apertures to enable a loop of said flexible member to be formed of such a size and shape for initially being disposed over the pouch of skin formed around said block and then tightened such that said block may not pass through the loop, whereby a force may be exerted on the second end of said flexible member to pull the skin from the animal; and

means for coupling said anchor block to said loop support member.

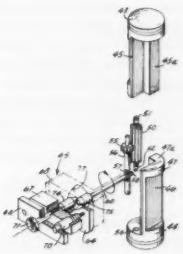
3,871,085

HIGH SPEED FOOD MEASURING AND/OR FORMING MACHINE

Russell J. Hahn, 2333 N. 37th St., Milwaukee, Wis. 53210

Filed May 14, 1973, Ser. No. 360,191
Int. Cl. A22c *7/00*
U.S. Cl. 17—32 **12 Claims**

1. An apparatus for measuring and forming food products comprising a cylindrical housing, a drum member rotatably disposed in said cylindrical housing, oppositely spaced cylinders carried by said drum member and opening to the outside of said drum member, piston members including two piston heads slidably engaging said cylinders and interengaged so that movement of one piston head effects a corresponding movement of the other and in the same direction, means to incrementally adjust the distance between said piston heads



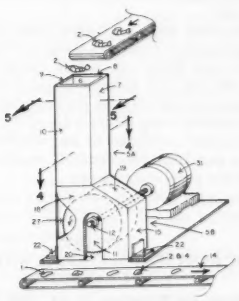
and means to rotate said drum member whereby a food product introduced under force into one cylinder in said drum in one position ejects similarly introduced food product from the opposite cylinder as the drum rotates and adjustment of the amount of the food product introduced may be readily varied.

3,871,086

APPARATUS FOR DE-SHELLING CRUSTACEANS

James E. Rutledge, 13543 Honey, Baton Rouge, La. 70808

Filed Sept. 5, 1973, Ser. No. 394,535
Int. Cl. A22c *29/00*
U.S. Cl. 17—73 **3 Claims**



1. A de-headed hard shelled crustacean de-shelling apparatus which comprises:

a. concentric parallel cutting blades, having serrated edges, mounted to a drive means, said blades spaced apart a distance less than the width of said crustacean, and

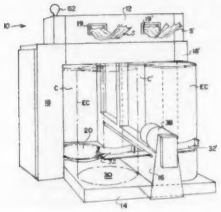
b. guiding means for guiding crustaceans, said guide means including a vertically extending hollow means for guiding crustaceans between cutting blades so as to permit crustaceans to fall by gravity to a position only between said spaced cutting blades.

3,871,087

CAN CHANGING APPARATUS FOR A TEXTILE SLIVER COILER

Richard J. Savageau, and Paul B. West, both of Clemson, S.C., assignors to Saco-Lowell Corporation, Easley, S.C.

Filed Oct. 16, 1973, Ser. No. 406,882
Int. Cl. B65h *54/80*
U.S. Cl. 19—159 A **15 Claims**



1. In combination with a textile sliver coiler adapted to fill cans with sliver, said coiler including an empty can station, can supporting means for supporting a can in a predetermined upright position thereon during filling of said can and for then reciprocatorily moving said can laterally along a linear path of travel, said can supporting means being located distal from said empty can station and reciprocatorily movable relative thereto in a substantially horizonal plane, the improvement comprising:

can changing means for, during can doffing of said coiler, moving an empty can from said empty can station onto said can supporting means, and into said predetermined position thereon, irrespective of the reciprocatory position then occupied by said supporting means; said can changing means including

can transporting means for engaging and transporting said empty can;

means mounting said can transporting means for guiding said can transporting means along a path of travel extending from said empty can station toward said supporting means and generally parallel to said linear path of travel; and means for, during each doffing of said coiler, moving said can transporting means a distance along said path of travel thereof correlated to and variable in accordance with the particular reciprocatory position then occupied by said can supporting means.

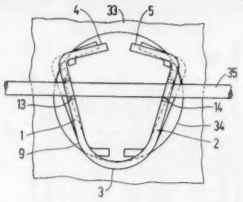
3,871,088

CLAMP OF RESILIENT MATERIAL ROTATABLE IN A CIRCULAR HOLE

Kajetan Leitner, am Winacker 18, 817 Bad Tolz, Germany

Filed Oct. 25, 1973, Ser. No. 409,473
Claims priority, application Germany, Oct. 27, 1972, 2221075
Int. Cl. A44b *21/00;* **F16l** *3/00*
U.S. Cl. 24—81 B **9 Claims**

1. A clamp of spring or resilient material rotatable in a circular hole, preferably for securing, rod type structures, such as Bowden cables, rods or the like, to sheet or panel type components, characterized in that the clamp is substantially of V-section with two arms (1,2) and a crosspiece or crossbar (10) connecting these, the arms (1,2) each forming two clips (8,9), of which one clip (8, the component clip) corresponding to the thickness of the component (33), has slots (19,20,21) extending transversely to the clamp for accommodating the component (33), and the arms (1,2) of the other clip (9, rod clip) are provided with perforations (13,15,17;



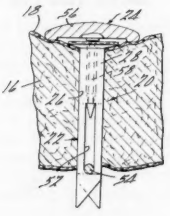
14,16,18) for pushing through the rod type structure (35) and in which the said rod type structure (35) is clamped.

3,871,089

UPHOLSTERY ELEMENT

John W. Kunz, 128 Elm Park Ridge, Pleasant Ridge, Mich. 48069

Continuation of Ser. No. 291,976, Sept. 25, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 441,667
Int. Cl. A44b *1/26*
U.S. Cl. 24—90 B **2 Claims**



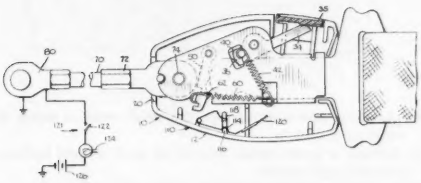
1. A two-piece upholstery device for a cushion having upholstery material along one side thereof and at least one wire-like member extending generally parallel to said side and spaced a predetermined distance from said upholstery material, said device including a molded retaining element fabricated of plastic material and having an upper body portion having a central bore formed therein with the lower end of said bore terminating in a generally outwardly radial surface, said retaining member also including a plurality of downwardly extending legs defining a cavity therebetween and formed integrally of said body, said legs being flexible independently of one another and being formed with a retaining shoulder on the lower end thereof, each of said retaining shoulders including a downwardly inclined camming surface and a generally flat upper surface, with said legs being normally orientated such that said camming surfaces thereof define a V-shaped recess which is engageable with said member to cause the lower ends of said legs to flex away from one another to permit said member to pass into said cavity upon downward movement of said retaining element, whereby said flat surfaces of said shoulders will engage the underside of said member to lockingly secure said retaining element to said cushion, with said retaining element being secured in a manner to compress the upholstered material when extending thereinto, said device also including a facing element including head and shaft portions the former of which overlies the upper end of said retaining element when said shaft portion is inserted into said bore, the lower end of said shaft portion including a locking part defining an enlarged shoulder spaced from said head the approximate distance of the length of said bore and received in the upper end of said cavity and engaging

said radial surface at said lower end of said body portion to lockingly secure said facing element to said retaining element.

3,871,090
SAFETY BELT BUCKLE

Louis Romanzi, Jr., Milford, and James A. Gavagan, Centerline, both of Mich., assignors to Irwin Industries, Inc., Greenwich, Conn.

Filed Aug. 24, 1973, Ser. No. 391,345
Int. Cl. A44b *11/26*; G60q *1/00*
U.S. Cl. 24—230 AV 6 Claims

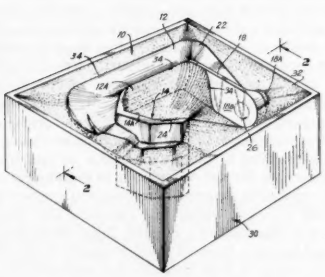


1. A vehicle safety belt buckle comprising a receptacle having a first opening and a passageway to receive a tongue having a recess therein; mounting means for attaching said buckle to a vehicle; a lock lever pivotally supported between the ends thereof, said receptacle having a second opening through which a first portion of said lock lever is accessible, first resilient means biasing said lock lever toward a position wherein a second portion of said lock lever resides within said passageway, an ejection lever pivotally mounted and extending within said receptacle, said ejection lever being movable between a first position wherein said ejection lever is within said passageway and spaced from said first opening less than the length of said tongue and a second position which is further from said first opening than said first position; second resilient means biasing said ejection lever toward said first position, an electrical switch within said buckle, said ejection lever being in contact with said switch when in said first position, said switch being connected to a signal circuit to indicate when said ejection lever is in said first position.

3,871,091
CLAMPING DEVICE

Robert A. Philibert, Burlington, and Frank L. Browne, Bristol, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,632
Int. Cl. A44b *21/00*; B22c *9/02*; F16l *3/24*
U.S. Cl. 24—243 R 8 Claims



1. A clamping device fastening a conduit or the like to a structural beam and comprising:

a body having a straight web portion extending between upper and lower ends of said body, said web portion having a convex inner surface adapted to be adjacent to said conduit;

a flange projecting outwardly from said web portion;

an arm extending from the upper end of the web portion at a substantially right angle therewith;

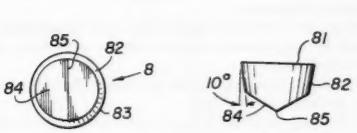
a cradle extending from the lower end of the web portion, said cradle being offset or canted with respect to said arm;

said clamping device being produced by forming the mold halves which define the clamping device such that at least part of the parting line extends substantially along the axis of symmetry of said web of said clamping device and such that the upper surface of the arm of the device is defined by one of the mold halves, said parting line continuing therefrom in such manner that the lower surface of the arm is defined by the other half of the mold, whereby at least said upper and lower surfaces of the arm adjacent to a hole to be formed therein are parallel.

3,871,092
CUTTING TOOL

Erhard Anschutz, Plochingen, and Walter Gotz, Wernau, both of Germany, assignors to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung, Dusseldorf-Oberkassel, Germany

Filed Nov. 27, 1973, Ser. No. 419,404
Claims priority, application Germany, Dec. 8, 1972, 2260097
Int. Cl. B26d *1/00*
U.S. Cl. 29—95 R 6 Claims

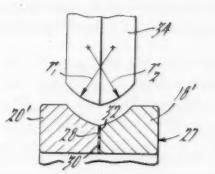


1. A tool bit having a flat top face of convexly arcuate circumference about an axis transverse to said face, an axial face tapering in a direction away from said top face, said circumference and said axial face jointly defining an annular cutting edge, and two flat seating faces converging from said axial face in a direction away from said cutting edge toward a line of intersection transverse to said axis, said top face, said axial face, and said seating faces jointly constituting the entire surface of said tool bit.

3,871,093
PROCESS FOR MAKING SPLIT-RING BALL BEARINGS

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Feb. 20, 1974, Ser. No. 444,120
Int. Cl. B23p *11/00*, *17/00*; B21h *1/12*
U.S. Cl. 29—148.4 A 10 Claims



1. In a process for fabricating a split-ring bearing assembly of the type comprising a pair of ring members at least one of

which is of a sectionalized construction and which are formed with raceways within which a plurality of antifriction elements are retained, the steps of forming a plurality of ring sections having a shape and size such that the assembly thereof substantially defines said sectionalized ring member, adhesively securing said ring sections together into a bonded ring assembly, finish machining the surfaces of said bonded ring assembly to the desired final dimensions and surface finish, and thereafter cleaving said bonded ring assembly and separating the mated final machined said ring sections preparatory to assembly thereof with the other ring member and antifriction elements into a bearing.

3,871,094
METHOD OF MAKING SEAMLESS TUBULAR BELL SECTION

William Lee Nichols, Brea, Calif., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Filed Apr. 26, 1974, Ser. No. 464,305
Int. Cl. B29d *17/00*
U.S. Cl. 29—169.5 **16 Claims**

1. A method for making a seamless tubular bell section of a musical instrument of sollid brass, comprising:

a. providing a blank of brass, tubing of uniform wall thickness and diameter;

b. drawing the blank to progressively taper its wall thickness along its length while maintaining the uniformity of its outside diameter;

c. by drawing, enlarging the end portion of the blank having the greater wall thickness;

d. by drawing, progressively reducing the diameter of the non-enlarged portion of the blank to provide ultimately a taper in the inside diameter which merges with the enlarged end portion;

e. while externally supporting the blank along its portion of tapered diameter, by means of hydraulic pressure, expanding the unsupported enlarged end portion; and

f. trimming and finishing the blank as a bell section.

16. A method for making a seamless tubular bell section of a musical instrument of solid brass, comprising:

a. forming a blank of solid tubular brass to provide an elongated portion of lesser diameter and a shorter portion of larger diameter, interconnected by an intermediate portion of tapered diameter;

b. while externally supporting the blank along its portion of tapered diameter, by means of hydraulic pressure, expanding the unsupported enlarged end portion; and

c. trimming and finishing the blank as a bell section.

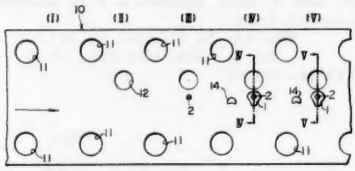
3,871,095
PROCESS FOR THE MANUFACTURE OF HAIR SPRING COLLET

Konoe Miyamoto, Sayama, and Atsushi Ohsuga, Tokorozawa, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Continuation of Ser. No. 283,758, Aug. 25, 1972, abandoned.
This application Mar. 7, 1974, Ser. No. 449,102
Claims priority, application Japan, Aug. 26, 1971, 46-64763
Int. Cl. B23p *13/00*
U.S. Cl. 29—178 **6 Claims**

1. A process for the manufacture of a series of spiral spring collets, each having parallel front and rear surfaces, a central bore for attachment to a balance wheel arbor and at least one radial projection having a spiral surface for attachment of an inner end portion of a hair spring comprising the steps of

1. continuously feeding a sheet stock at a constant speed,
2. punching a series of pilot holes longitudinally along each side edge of the sheet stock at regular pitches and at a small distance from said edges,
3. punching-roughly a series of smaller central bores in the sheet stock,

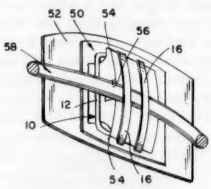


4. punching half-way through the sheet stock a series of outlines of collets,
5. forming a spring guide groove on each of said halfway punched-out collets,
6. punching-finishingly through the rough-punched central bores in succession, and
7. punching through the collets in succession.

3,871,096
ORTHODONTIC SPRING CLIP

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Filed Nov. 8, 1972, Ser. No. 304,731
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A **19 Claims**

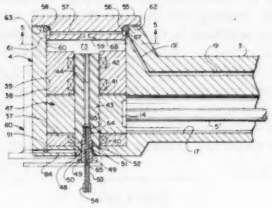


1. An orthodontic appliance for use with an orthodontic arch wire, comprising an orthodontic bracket having a front portion and a rear portion of reduced cross-sectional area connectable to an orthodontic band, whereby said bracket forms with the band at least one channel extending along the latter, the arch wire extending proximate said bracket; a resilient collar configurated in the shape of an open and substantially planar loop having a pair of opposing free end portions proixmate to one another and normally spaced from one another a distance smaller than the transverse dimensions of said rear portion, said loop having dimensions corresponding to the external dimensions of said rear portion and being made of a resilient material to permit separation of said free end portions to increase the size of said loop to thereby permit the same to be releasably snapped onto said rear portion and at least partially received within said channel; and elongated finger means in the form of a biassing finger extending from said loop and having a biassing portion spaced to one side of said loop and being at least partially and resiliently movable in directions generally transverse to the plane defined by said loop and arranged to apply forces to the arch wire relative to said bracket, whereby said biassing finger is placed in a biassing condition when said free end portions are separated and said loop snapped onto said bracket.

3,871,097
COOLING SYSTEM FOR A DENTAL HANDPIECE

Chris R. Melde, 7007 3rd Avenue, Scottsdale, Ariz. 85251

Continuation-in-part of Ser. No. 272,202, July 17, 1972, Pat. No. 3,778,904. This application Nov. 5, 1973, Ser. No. 412,759
Int. Cl. A61c 1/10
U.S. Cl. 32—27 13 Claims



1. In a dental handpiece having a handle, a shank, a head including a cylindrical cavity therein, an air operated turbine assembly disposed within the cavity, the turbine assembly including a hollow rotor in communication with one end of the turbine assembly and a hollow burr engaged to the one end of the hollow rotor and extending from one end of the head, the improvement comprising in combination:

a. conveying means for transporting a flow of air to the head;

b. a cap secured to the other end of the head for sealing one end of the cylindrical cavity;

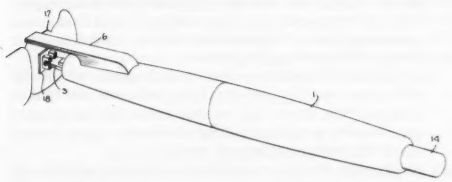
c. a collection chamber disposed within the cylindrical cavity, said collection chamber being defined by the cylindrical wall of the cylindrical cavity, said cap and said one end of the turbine assembly; and

d. transmission means for transmitting a flow of air from said conveying means to said collection chamber; whereby, the air transmitted to said collection chamber establishes an air pressure buildup within said collection chamber to force a flow of air into the hollow rotor and through the hollow burr to cool the working section of the hollow burr and the workpiece.

3,871,098
BRACKET PLACER

J. Thomas Dean, 205 Haverhill Cir., Easley, S.C. 29640

Continuation-in-part of Ser. No. 277,554, Aug. 3, 1972, abandoned. This application Sept. 27, 1973, Ser. No. 401,276
Int. Cl. A61c 7/00
U.S. Cl. 32—66 7 Claims



1. A positioning device for placing orthodontic brackets on the labial surface of a tooth which comprises:

a. an elongated body portion;

b. holding means adapted to engage the bracket being placed on the surface of the tooth, said holding means being disposed at the forward end of said elongated body and fixedly held with respect thereto;

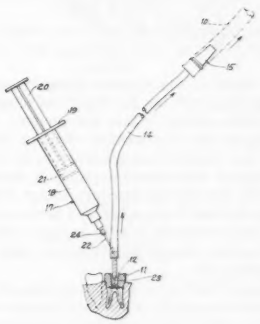
c. guide means mounted to said forward end of said elongated body and adapted to engage the incisal edge of the tooth, said guide means being disposed a predetermined distance from said holding means so that the bracket may be accurately positioned on the labial surface of the tooth by appropriate positioning of said guide means, and

d. means slidably mounted with respect to said elongated body and adapted to move parallel to the longitudinal axis thereof, said slidable means being movable with respect to said holding means so as to allow the bracket being positioned to be moved forwardly into engagement with the surface of the tooth and away from said holding means.

3,871,099
METHOD FOR CLEANING CAVITIES WITH A COMBINED FLUID DELIVERING AND ASPIRATING INSTRUMENT

Henry Kahn, Highland Park, Ill., assignor to KG Company, Chicago, Ill.

Continuation of Ser. No. 183,973, Sept. 27, 1971, abandoned. This application Dec. 28, 1973, Ser. No. 429,079
Int. Cl. A61c 3/00
U.S. Cl. 32—40 R 8 Claims



1. A method particularly useful in dental and surgical procedures for cleansing a cavity by aspirating fluids and other materials from a cavity and delivering fluids such as medicaments into said cavity comprising inserting into the cavity the working end portion of a plastic suction tube of a self-sealing composition having memory when penetrated, the working end portion having the working end portion of a hypodermic needle which has been inserted through the wall of said tube portion in fluid-sealing relationship interiorly positioned in substantially coaxial relationship with the interior of said tube portion, the working end portion of the needle having been bent at an acute angle to the needle axis so that the portion of the needle remaining outside the tube for the attachment of a hypodermic syringe is at an angle to said suction tube, attaching a hypodermic syringe filled with the selected liquid to said needle, connecting the distal end of said suction tube to a vacuum source and simultaneously, or in selected independent sequence, delivering the liquid from the syringe into the cavity and withdraw liquid and other matter from said cavity through said suction tube.

3,871,100
MARKING GAUGE

William J. Hildebrandt, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.

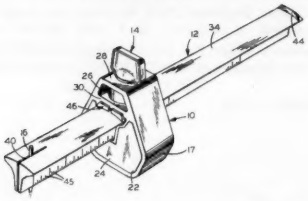
Filed June 28, 1973, Ser. No. 374,644
Int. Cl. B43l 13/02
U.S. Cl. 33—42 9 Claims

1. A marking gauge comprising:

A. a body member having an aperture extending therethrough of generally T-shaped configuration providing a

transverse top portion and a stem portion of lesser width with the wall defining said aperture including a pair of shoulder faces adjacent said top portion and diverging from said stem portion of said aperture towards said top portion, said should faces extending in opposed spaced relationship on opposite sides of and parallel to the longitudinal axis of said aperture;

B. an elongated rule member of generally T-shaped configuration complementary to said aperture of said body member and slidably seated in said aperture, said rule member having a top portion and a stem portion of lesser width with a pair of shoulder faces diverging from said stem portion towards said top portion and extending in parallel relationship to the shoulder faces of said body member along at least a substantial portion of the length of said



rule member, the shoulder faces of said rule member cooperating with the shoulder faces of said body member for stable seating of said rule member thereon and for sliding of said rule member along its length thereupon, said rule member being cooperatively dimensioned and configured with respect to said body member aperture to provide spacing therebetween except along said cooperating shoulder faces, wherein a portion of the rule member which normally may be engaged with a work surface and collect foreign matter is not used in said seating function; and

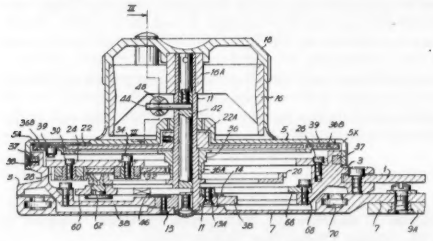
C. means on said body member engaging the upper surface of said top portion of said rule member for locking said rule member in fixed position within said aperture of said body member with said shoulder faces in firm surface contact.

3,871,101

ARRANGEMENT IN A DRAFTING MACHINE FOR PRECISE MEASUREMENT OF ANGLES

Angiolo Becattini, via del Cantone 5, and Pietro Angelo Sassi, S. Casciano Val DI (FI) - La Romola, both of Florence, Italy

Filed July 18, 1973, Ser. No. 380,167
Claims priority, application Italy, July 19, 1972, 9594/72
Int. Cl. B43l *13/02*
U.S. Cl. 33—79 R **7 Claims**



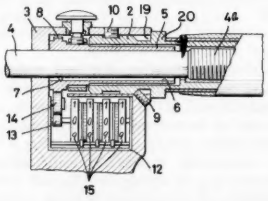
1. An arrangement in a drafting machine for precise measurement of angles comprising, in combination, a support moveable parallel to a predetermined direction; an angularly moveable element carried by said support and having a positioning grip; a goniometer including two coaxial scales, a coarse and a fine scale, rotatable relative to each other according to a given ratio, wherein said scales can be read through a window on a cover of the instrument and provided with a reference line; and a transparent disk mounted on said cover under said window, having a second reference line usable in connection with said first-named line on the window; said disk being in turn angularly adjustable relative to said cover; the whole assembly being angularly adjustable to allow, in conjunction with said disk, to shift the readings of origins of angles to be measured; said support including a central, hollow shaft forming the rotational axis of said scales and containing in addition in its inner portion elements of a mechanical transmission, allowing a locking device of a mobile part to be controlled from said grip to assume given angular positions; said goniometer providing instant angle readings in degrees and minutes, directly and without a vernier being needed; and said goniometer being provided for attachment to any type of universal drafting device by means of a suitable connector.

3,871,102

MICROMETER

Ichiro Miura, Sumoto, and Hiroshi Suzuki, Shuizuki, Hyogo-ken, both of Japan, assignors to Nihon Sokutei Kogu Kabushiki Kaisha, Shuizuki, Hyogo-ken, Japan

Filed Sept. 26, 1973, Ser. No. 400,817
Claims priority, application Japan, Oct. 6, 1972, 47-117526
Int. Cl. G01b *3/18*
U.S. Cl. 33—166 **2 Claims**



1. A micrometer, comprising:

a substantially U-shaped frame;

a hollow cylindrical member formed on one side of said frame;

a first sleeve having a first portion rotatably positioned within said cylindrical member and a second portion extending therefrom;

a spindle positioned in said first sleeve and said cylindrical member and extending through and projecting from said cylindrical member toward the other end of said U-shaped frame, said spindle being threaded in the region thereof corresponding to the portion of said first sleeve extending from said cylindrical member, said first sleeve being correspondingly threaded;

a second sleeve slidably mounted on said spindle within said cylindrical member and interposed between said spindle and said first sleeve, said second sleeve having an axial groove in the periphery thereof and having a gear formed about the periphery thereof;

a pin fixed to the outer periphery of said first spindle and slidably engaged in said axial groove of said second sleeve;

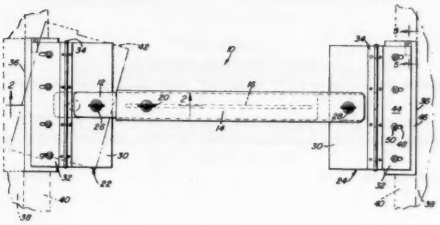
a counter means having a gear meshing with said gear of said second sleeve; and

a setting screw extending through the periphery of said cylindrical member and adapted to contact said first sleeve for locking said first sleeve, said setting screw adapted to be rotated from a position externally of said cylindrical member for separating said setting screw from said sleeve for releasing said first sleeve, whereby adjustment may be readily accomplished.

3,871,103
POWER SAW PRECISION STAIN GAUGE

Harold W. Simmons, 1545 S.W. 192nd St., Aloha, Oreg. 97006

Filed July 9, 1973, Ser. No. 377,232
Int. Cl. E04f 21/26; G01b 5/14
U.S. Cl. 33—174 R 5 Claims



1. A stair tread and riser gauge for use with a portable power saw of the type having a slide shoe with a guide edge spaced from and paralleling a cutting edge, said gauge including an elongated framework having opposite end portions and means for adjustably varying the effective length of said framework between said opposite end portions, a pair of generally co-planar plate-like sizing assemblies mounted on opposite end portions of said framework, at least one of said assemblies including a first base plate portion including an outer edge portion generally transverse to the longitudinal extent of said framework, said base plate portion being pivotally supported from the corresponding framework end portion for adjustable angular positioning relative to said corresponding framework end portion about an axis extending transverse to the longitudinal extent of said framework and disposed substantially normal to said sizing assemblies, said sizing assemblies including remote gauge edge portions disposed transverse to said axis and the longitudinal extent of said framework, a shiftable plate portion including opposite edge portions generally paralleling each other, one of said opposite edge portions of said shiftable plate portion being hingedly supported from said outer edge portion for angular displacement of said shiftable plate portion relative to said base plate portion about an axis generally paralleling said outer edge portion between an inactive position overlying said base plate portion and retracted above said outer edge portion and an active position with said shiftable plate forming an outward generally co-planar extension of said first base plate portion, the gauge edge portion of said one assembly being supported from said shiftable plate portion on the side thereof opposite from said one opposite edge portion, said gauge edge portion and said outer edge portion of said one assembly, when said one assembly is in its active position, being spaced apart a distance corresponding to the spacing between the guide edge of the slide shoe and the cutting edge of the saw.

3,871,104
ALIGNMENT SIGHTING DEVICE

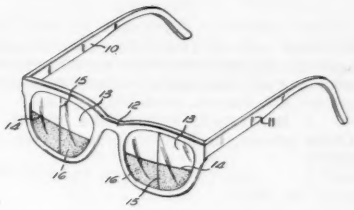
John V. Underhill, II., 721 N.W. 37th St., Ft. Lauderdale, Fla. 33309

Filed Dec. 5, 1973, Ser. No. 421,842
Int. Cl. G01c 9/26, 15/00
U.S. Cl. 33—262 4 Claims

1. An eyeglasses-type alignment sighting device comprising: an eyeglasses frame;

a pair of laterally spaced lenses in said frame for the wearer's left and right eyes, respectively; each of said lenses having a hollow interior and having a horizontal sighting line extending laterally across it;

and a non-transparent liquid filling the hollow interior of each lens to the level of the horizontal sighting line thereon so that the top of the liquid registers with said

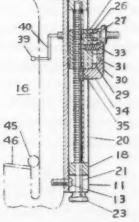


horizontal sighting line when the latter is precisely horizontal.

3,871,105
ADJUSTABLE SIGHTING DEVICE FOR ARCHERY BOW

George D. Brougham, P.O. Box 37, R.D. No. 2, Gillett, Pa. 16925

Continuation-in-part of Ser. No. 381,252, July 20, 1973, Pat. No. 3,849,894. This application Feb. 14, 1974, Ser. No. 442,381
Int. Cl. F41g 1/46
U.S. Cl. 33—265 2 Claims



1. An archery bow sight adapted to be mounted on the side of a bow, comprising:

a. an elongated channel housing having a U-shaped cross section defined by a bottom wall and side walls;

b. mounting means for attaching the housing to the bow;

c. an elongated lead screw disposed longitudinally within the housing having a shaft extending therefrom;

d. a knob affixed to said shaft;

e. bearings mounted on the respective end portions of said housing for rotatably supporting said lead screw;

f. a carrier block having an opening therethrough for slideably mounting said carrier block on said screw, and being dimensional to cooperate with said channel housing to prevent rotation of said carrier block with respect to said lead screw;

g. a support bar mounted on said block transversely disposed with respect to said housing, said bar carrying a sighting bead at each end;

h. an L-shaped locking lever mounted on said block and pivotally supported thereon;

i. said lever having at one end a threaded face portion engaging said lead screw and, at the other end, a shank in contact with a biasing spring, tending to maintain said face portion in engagement with said screw, whereby, upon manually depressing said shank, said face portion becomes disengaged from said lead screw, allowing the free movement of said carrier block over said screw for

coarse adjustment of the height of said bar and, upon releasing the pressure from said shank, engagement thereof is effected, permitting fine adjustment of the height of said bar by the turning of said knob.

3,871,106

METHODS AND APPARATUSES FOR DYNAMIC AXLE ANGLE MEASUREMENT ON MOTOR VEHICLES

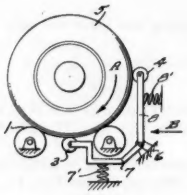
Horst Hegenbart, Bensheim/Schwanheim, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany

Filed June 12, 1973, Ser. No. 369,392

Claims priority, application Germany, June 14, 1972, 2228988

Int. Cl. G01b *5/255, 7/315*

U.S. Cl. 33—203.13 **8 Claims**



1. A method of dynamic axle angle measurement in a motor vehicle, comprising:

rotating a wheel with tire to be measured;

applying first and second sensing rollers to the tread surface with one of the sensing rollers engaging the tread surface adjacent to a horizontal plane containing the wheel axis with the sensing rollers being maintained parallel to each other so that the camber angle of the wheel causes displacement of said other sensing roller along its axis and said track alignment angle cause simultaneous displacement of said one roller to displaced positions in which the sensing rollers lie parallel to the wheel rotational axis; and

determining camber angle and/or track alignment angle from the displaced positions of the sensing rollers.

3,871,107

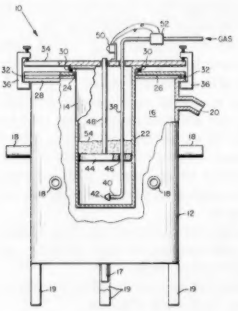
LABORATORY FREEZE DRYER

Samuel M. Broadwin, 60 East 8th St., New York, N.Y. 10003

Filed Apr. 2, 1974, Ser. No. 457,240

Int. Cl. F26b *13/30;* **F25d** *3/12*

U.S. Cl. 34—92 **9 Claims**



1. Vacuum trap apparatus useful as a laboratory freeze dryer comprising:

a. inner and outer shells forming a closed spaced therebetween which can be evacuated, said inner shell being metallic and providing a condensing surface on which vapors from the goods being freeze dried are condensed;

b. valved means for introducing a gas under pressure into said inner shell adjacent the bottom thereof, said gas expanding in said inner shell to form a snow for cooling the walls of said inner shell, and

c. control means acting to open and close said valve means responsive to the level of snow in said inner shell respectively falling below and reaching a predetermined level for controlling the introduction of said gas into said inner shell and maintaining the level of snow at substantially said predetermined level.

3,871,108

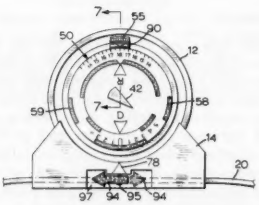
DIRECTIONAL DEVICE

Henri Beaudout, 11970 Langelier, Apt. 201, Montreal, Quebec, Canada

Continuation-in-part of Ser. No. 133,314, April 12, 1971, abandoned. This application Mar. 5, 1973, Ser. No. 338,038

Int. Cl. G01c *17/04*

U.S. Cl. 33—349 **12 Claims**



1. A directional device for use in overland travel, comprising:

a frame;

a pair of concentric planar circular dials each mounted on said frame for rotation relative to said frame and to each other about their common axis;

one of said dials having at least one first reference indicium; the other of said dials being divided about its circumference into two individually distinguishable semi-circular arcs with a second reference indicium marking at least one of the two junctions between said arcs;

means for releasably clamping the pair of dials together for mutual rotation about their common axis relative to the frame;

means for releasably securing said one dial on the frame against rotation relative thereto;

index means on the frame with which the first reference indicium on said one dial may be registered on rotation of said one dial;

a magnetic compass needle mounted for free pivotal movement about said common axis relative to the other dial being registrable with the needle on rotation with respect to said other dial of said other dial; and

memory indicator means having further index means thereon, said indicator means being mounted on said frame adjacent said other dial and rotatable concentrically therewith, and means to inhibit the indicator means against free rotation.

3,871,109

LEVEL VIAL

Peter P. Vaida, 17 Fairview Ave., Clinton, N.J. 08809

Filed Mar. 12, 1973, Ser. No. 340,522

Int. Cl. G01c *9/34*

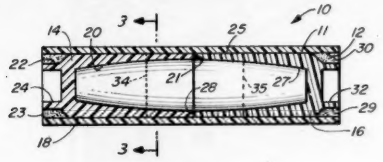
U.S. Cl. 33—379 **19 Claims**

1. A spirit level vial comprising:

a generally cylindrical transparent outer body having a longitudinal axis and a longitudinally extending generally cylindrical outer surface;

a longitudinal bore formed in said outer body and extending through at least a portion of said outer body, said longitudinal bore defining a generally cylindrical inner surface on said outer body;

at least a pair of insert means rigidly received within said longitudinal bore of said outer body, each said insert means including a cylindrical outer surface and a longitudinal bore defining a curved inner surface, said curved inner surface of each insert means cooperating to define a bubble chamber;



said outer surface of each said insert means being substantially equal in diameter to said generally cylindrical inner surface of said outer body;

reference means on said vial for permitting a determination of the position of said longitudinal axis of said spirit level vial with respect to the horizontal; and

means for precluding the passage of fluid between said outer surface of said insert means and said inner surface of said outer body.

3,871,110

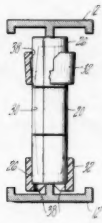
LEVEL VIAL ASSEMBLY

Antoni Pawel Gutowski, New Britian, and Maarten Cornelis De Jong, Canton, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Dec. 10, 1973, Ser. No. 422,981

Int. Cl. G01c *9/28*

U.S. Cl. 33—379 **3 Claims**



1. A level comprising a frame provided with parallel working surfaces and an interconnecting web, said web providing a pair of oppositely directed notches, an elongated vial positioned with its ends precision fitted in said pair of notches for mounting the vial at a preselected relationship relative to the working surfaces with the longitudinal axis of the vial generally parallel with the plane of the web, and a pair of generally cylindrical sleeves telescopically received over the ends of the vial, an inwardly directed shoulder at one end of each of said sleeves restricting the opening of said sleeves to a diameter less than the diameter of said vial, said one end of said sleeves being slotted to accommodate the expansion of said one end of said sleeves so that the sleeves may expand to a position where the shoulders surround the vial to permit the removal and assembly of the vial on the web, the slots in said one end of said sleeves being further dimensioned to closely receive the web, said slots of the sleeves and said shoulders of the sleeves being so related that when the sleeves are moved into a latching position the slots of the sleeves closely receive the web and the shoulders of the sleeves snap into locking engagement with the ends of the vial.

3,871,111

DEVICE FOR DRYING MOIST MATERIAL TO BE GROUND

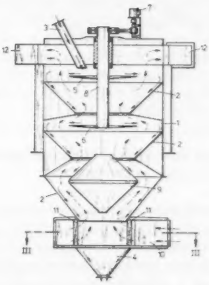
Karl-Heinz Porr, Ostenfelde, Germany, assignor to Gebruder Hischmann Maschinenfabrik, Ennigerloh/Westf., Germany

Filed Aug. 9, 1973, Ser. No. 387,105

Claims priority, application Germany, Aug. 9, 1972, 2239098

Int. Cl. F26b *19/00*

U.S. Cl. 34—173 **6 Claims**

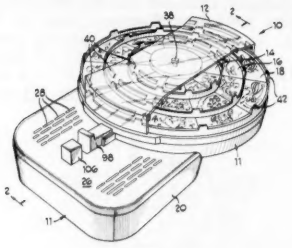


1. A device for drying moist material to be ground, especially pit moist lime and clay, which includes a housing having an upper portion with inlet means for conveying material to be dried into the interior of said housing and also having a lower portion with central outlet means for discharging dried material from said housing, twist ring means including a helical guiding path and arranged adjacent said outlet means for introducing hot air into said housing in countercurrent flow to the flow of material to be dried, rotatable stray dish means arranged within said housing for receiving and distributing the material to be dried with a twist opposite to the twist of the hot air flow, said rotatable stray dish means including means for driving connection with a motor, hot air discharge means arranged at the upper portion of said housing for discharging hot air from said housing, and funnel-shaped downwardly tapering guiding surface means arranged in the interior of said housing for guiding the material to be dried from the upper portion of said housing through the latter and for conveying hot air in countercurrent flow to the flow of material to be dried to said hot air discharge means, said housing below every said funnel-shaped guiding surface means having configuration which widens again to largest diameter of said housing and subsequently narrows again toward said outlet means, a double cone arranged in a range of the lowermost guiding surface means within said widening and narrowing guiding surface means in spaced relation thereto to define therewith a path for hot air and for dried material, said funnel-shaped guiding surface means including a plurality of serially arranged downwardly tapering conical guiding surfaces and at least two stray dishes arranged in vertical direction one below the other and located within the region of the largest diameter of said housing, and at least one motor driving means driving said stray dishes upon the uppermost of which material to be dried is given off, said twist ring means including one portion thereof arranged above said outlet means for entry of hot air which streams through said housing from below to the top with a twist counter to twist of said stray dishes through which material is directed.

3,871,112
COORDINATED VISUAL AND AUDIO REPRODUCING APPARATUS

Gunars Licitis, Lombard, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Continuation-in-part of Ser. No. 282,377, Aug. 21, 1972, Pat. No. 3,801,110. This application Oct. 1, 1973, Ser. No. 402,093
Int. Cl. G09b *1/00*
U.S. Cl. 35—8 A **18 Claims**



1. A multiple message reproducing apparatus with coordinated visual images, comprising:

a housing;

a sound record movably mounted on said housing and having a plurality of relatively movable parts with sound track portions on each part, one of the parts having at least one sound track portion in position for registry with any one of a plurality of the sound track portions on another record part to provide a sound track extending over both record parts, thereby providing for selective changing of the sound track in response to selective adjustment of the record parts to provide selectable multiple audio messages;

a visual image assembly mounted on said housing and having a plurality of relatively movable parts with visual images on each part, the visual images being correlated with the sound track portions on said record parts, one of the parts of the visual image assembly having at least one visual image in position for registry with any one of a plurality of visual images on another part to provide an aligned series of visual images extending over both parts, thereby providing for selective changing of the visual image series in response to selective adjustment of the parts; and

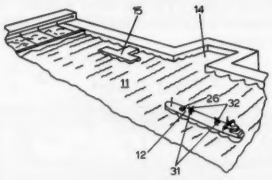
means for coupling said sound record parts and said parts of said visual image assembly for conjoint adjustment so that said visual images when in a selected registrable series are correlated to the particular audio message provided by the sound track of said sound record.

3,871,113
NAVIGATION TRAINING SIMULATORS

William Arthur Crago, and Derek Martin Emmerson, both of Isle of Wight, England, assignors to British Hovercraft Corporation Limited, Yeovil, Somerset, England

Filed June 6, 1973, Ser. No. 367,418
Claims priority, application United Kingdom, June 7, 1972, 26532/72; Aug. 14, 1972, 37784/72
Int. Cl. G09b *9/08*
U.S. Cl. 35—10.2 **9 Claims**

1. A ship navigation training simulator comprising a dynamic model representative of a full scale ship and comprising a radio controlled model ship, a control station separated from said model and representative of a portion of the bridge of the full scale ship, means on the model responsive to inputs from the control station for moving and controlling the model when the model operates in an environment representative of the environment in which the full scale ship operates, means on the model for viewing and transmitting to the control station the visual appearance of objects external thereto, and means at the control station for visual display of the transmission from the model, said viewing means on the model comprising a pivotally mounted television camera responsive to the action of an operator at the control station in scanning to either side

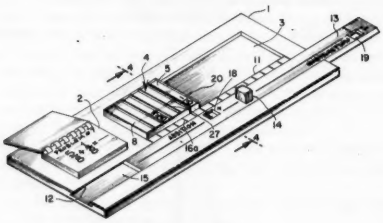


of straight ahead relative to the model so that this view is represented at the control station, said simulator further comprising means, responsive to the swivelling movement of a chair for a student at the control station, for generating a signal which causes corresponding movement of the television camera.

3,871,114
DEVICE FOR TEACHING THE ADDITION OF FRACTIONS

Joseph Honig, 3 Warthburg Place, Valhalla, N.Y. 10595

Filed May 17, 1974, Ser. No. 470,773
Int. Cl. G09b *19/02*
U.S. Cl. 35—31 D **10 Claims**



1. A device for teaching addition and subtraction, respectively, comprising:

a board having a longitudinal insert recess;

a plurality of bars having the same width and a plurality of blocks, said blocks having a width exactly equal to integral numbers times the width of said bars;

said bars and blocks being insertable in said insert recess and are complementary at least in part thereto in a manner such that the widths of said bars and blocks are aligned in the longitudinal direction of said insert recess;

a slide rule displaceably mounted on said board longitudinally with respect to said insert recess;

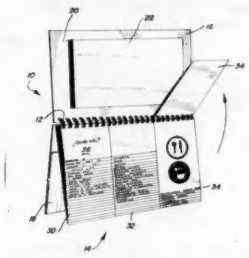
said board having at least one numerical fractional scale of fractional numbers corresponding to a division of said insert recess in said longitudinal direction of said insert recess in units of the width of said bars; and

said slide rule being formed with indicator means cooperating with one of said fractional numbers for indicating the answer to the solution of an addition problem and subtraction problem, respectively, corresponding to the blocks and bars positioned in said insert recess.

3,871,115
LANGUAGE COMMUNICATOR

Earl J. Glass, 225 Westmoreland, Wilmette, Ill. 60091, and Gerald S. Geren, 79 E. Greenbriar Dr., Deerfield, Ill. 60015

Filed Apr. 30, 1973, Ser. No. 356,061
Int. Cl. G09b *19/08*
U.S. Cl. 35—35 E **6 Claims**

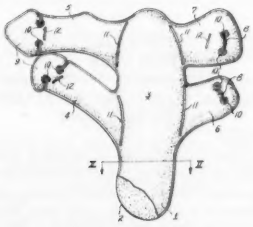


1. A foreign language communicator for permitting the user to communicate with one who understands little, if any, of the user's language, the improvement which comprises said communicator including a plurality of adjacent flip-chart means arranged in cooperative viewing relationship, each of said flip-chart means including a plurality of individual sheets, one of said flip-chart means having in written form on each of a plurality of sheets thereof, at least the predicate of a sentence in said foreign language and a second flip-chart means having on each of a plurality of sheets thereof at least one readily identifiable pictogram, for use in association and combination with said predicate so that when a sheet from said first chart and a sheet from said second chart are viewed together a basic level of communication is established and so as to provide for the selection of a plurality of combinations of said predicates and said pictograms.

3,871,116
ASEPTIC DISPOSABLE MULE OR SLIPPER

Pierre Vanderlinden, 25 Rue Vandervelde, B-7000 Mons, Belgium

Filed Mar. 5, 1974, Ser. No. 448,181
Claims priority, application Belgium, Nov. 23, 1973, 138119
Int. Cl. A43b *3/12*
U.S. Cl. 36—11.5 **5 Claims**

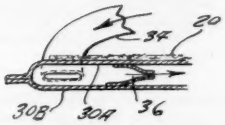


1. A mule or similar slipper made up in one piece providing a sole and a vamp formed by hooking tongues in slits provided at the end of flaps extending on either side of the said sole, these items being comprised of a cellular resilient material, wherein the cellular resilient material, the outside face of which has been smoothed, is in the form of two sheets confining a volume of air in between them because of the fact that the free edges of the item providing the sole and vamp are welded together.

3,871,117
FLUID FILLED INSOLES

Rex E. Richmond, and George Spector, both 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Apr. 17, 1973, Ser. No. 351,867
Int. Cl. A43b *13/38*
U.S. Cl. 36—43 **5 Claims**

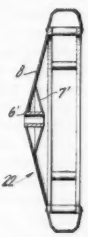


1. A hollow fluid filled insole with toe and heel portions formed from resilient material having spaced upper and lower surfaces peripherally sealed in combination with a duct extending externally from the insole connecting the toe and heel portions including a valve extending transversely across the interior of the insole connecting between opposing portions of the peripheral seal, said valve permitting flow only in one direction responsive to pressure in said insole generated by the user's foot.

3,871,118
EXCAVATING WHEEL CONSTRUCTION

Heinz Brech, Lubeck, Germany, assignor to Orenstein & Koppel AG, Lubeck, Germany

Filed June 14, 1973, Ser. No. 369,991
Claims priority, application Germany, June 28, 1972, 7224073
Int. Cl. E02f *3/24*
U.S. Cl. 37—189 **4 Claims**



1. An excavating or earth moving device comprising a rotatable wheel having a hub portion for rotatably supporting said wheel and a plurality of circumferentially spaced material removing blades projecting outwardly from the periphery of said wheel, said wheel comprising only a single conical disc extending the complete distance between said hub portion and said blades, said conical disc being secured to said hub adajcent one end of said disc and sloping from said hub toward the opposite end of said disc, and including a short conical member extending between the opposite end of said hub and said conical disc and being secured to said conical disc.

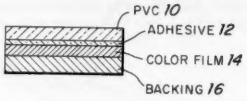
3,871,119
LAMINATED IDENTIFICATION CARD

Simon E. Mayer, Levington, Mass., assignor to Avant Incorporated, Lincoln, Mass.

Filed Feb. 28, 1972, Ser. No. 229,699
Int. Cl. G09f *3/02*
U.S. Cl. 40—2.2 **9 Claims**

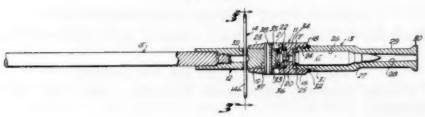
1. A permanent identification card comprising a photographic print having identifying indicia thereon and an optically-transparent, plastic sheet bonded to said photographic

print by a heat-activatable, medium molecular weight, linear, saturated polyester adhesive composition containing from about 0.2% to about 2% by weight of an organic peroxide bonding promoter, and about 2% to about 25% by weight of



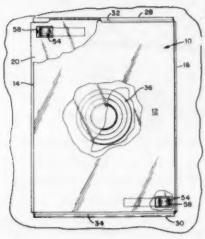
a copolymer formed from vinyl pyrrolidone and a comonomer substantially compatible with said polyester adhesive, said weight percent being based on the total of the polyester adhesive and vinyl pyrrolidone copolymer said polyester adhesive composition also being optically-transparent when cured.

3,871,120
GUN BARREL AND FIRING MECHANISM FOR IMPACT-ACTUATED UNDERWATER GUNS
Bruce A. Mounier, 9321 S.W. 80th Ter., Miami, Fla. 33143
Filed Oct. 9, 1973, Ser. No. 404,499
Int. Cl. F41c *27/00*; **F42b** *13/54*
U.S. Cl. 42—1 L **3 Claims**



1. A gun barrel and firing mechanism for impact-actuated underwater guns comprising, in combination, a breech member, an axial bore in one end of said breech member, a cylindrical detonating plunger one end of which is slidingly received in said axial breech member bore, means constraining the relative sliding of said detonating plunger with respect to said breech member to movement between inner and outer limit positions, means resiliently constraining said detonating plunger at said outermost limit position with respect to said breech member, the inner end of said detonating plunger having an outwardly extending, reduced-diameter firing pin, the other end of said breech member providing at its other end an anvil surface for seating the firing end of a cartridge having a peripheral flange, a tubular gun barrel having a through bore, means for removably attaching one end of said barrel coaxially with respect to said other end of said breech member, a coaxial firing pin opening communicating between the inner end of said axial breech member bore and said anvil surface, said through bore opening at said one end of said barrel being such as to slidingly receive a cartridge to be fired, said firing pin being of such size as to be receivable through said firing pin opening, the length of said firing pin with respect to the length of said firing pin opening being such that upon said detonating plunger reaching its innermost limit position with respect to said breech member said firing pin will move into detonating position with respect to a cartridge seated on said anvil surface, removable safety lock means for locking said detonating plunger at said outermost limit position with respect to said breech member to prevent accidental detonating of a cartridge seated on said anvil surface, said means constraining the relative sliding of said detonating plunger with respect to said breech member to movement between said inner and outer limit positions comprising a transverse, diametrically extending through bore near said one end of said breech member and intersecting said axial breech member bore, a transverse, diametrically extending bore in said detonating plunger near the inner end thereof, and a resilient sleeve pin friction fitted in said transverse detonating plunger bore and having outer end portions extending through opposite ends of said transverse breech member bore, said breech member bore being of substantially greater diameter than that of said transverse detonating plunger bore.

3,871,121
PICTURE FRAME
Charles B. Tornell, 46 Bradbury, Rd., New Castle, Del. 19720
Filed Aug. 9, 1973, Ser. No. 386,964
Int. Cl. G09f *1/12*
U.S. Cl. 40—152.1 **10 Claims**

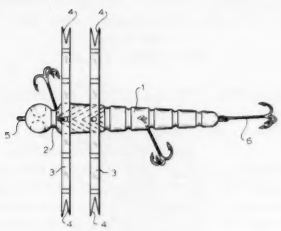


1. A picture frame or the like adapted to be hung either horizontally or vertically comprising in combination a substantially flat, transparent and rigid front member having a pair of oppositely disposed mutually parallel edges, a back member including a substantially flat portion having a front surface positioned in closely spaced parallelism with a surface of said front member thereby to hold a displayed object between said surfaces and having a pair of opposite disposed parallel edges provided with integrally formed inturned terminal flanges adapted to cooperate in slideable engagement with a pair of front member edges, said back member further including a centrally located circular ring shaped hanging means having an inwardly projecting flange, said hanging means being affixed to a rear surface of said back member and spring means fixed to said rear surface and extending through an opening provided in said back member to exert holding pressure on said displayed object and said front member surface, and a circular shaped retaining means having an outwardly directed flange for matingly cooperating with said inwardly projecting flange of said hanging support means to permit relative rotation between said hanging means and said retaining means and an aperture in said retaining means adapted to receive a means for affixing said retaining means to a vertical surface.

3,871,122
FISH LURE
Dennis Y. Jacobs, 5536 25th St. W. Bradenton, Fla. 33507
Filed Jan. 15, 1973, Ser. No. 323,694
Int. Cl. A01k *83/06*
U.S. Cl. 43—42.27 **1 Claim**

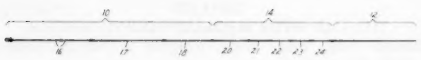
1. A fishing lure constructed to simulate the body of a dragon fly, said body constructed of floatable material, such as wood and having a forward annular groove cut therein to simulate the head of a dragon fly, said body continuing in a straight line from its front head portion to its rear portion extending in a straight axial line thereby being free from motion creating curvatures, a pair of flat strips flexible tough rubber attached to the upper surface of the body intermediate their ends and extending laterally to each side of the body and in parallel relation to each other rearwardly of the head simulating groove, said rubber strips being free of any curvatures whereby when the lure is drawn over the surface of the water the lure will be prevented from rising from or skipping above the surface of the water, said strips spaced sufficient distance apart whereby the positions of the flat strips on either side of

the body are capable of independent movement relative to each other and the body to cause unrelated movement of the portions of the strips on opposite sides of the body to create agitation in the water while the lure is being drawn through the



water and simulate a dragon fly in distress, and one or more gang hooks attached axially to the body and depending therefrom and so located as to counter-balance the action of the flexible wing forming strips while the lure is either in flight or in action through the water.

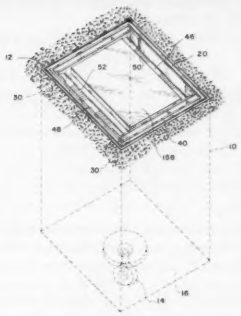
3,871,123
SHOCK-ABSORBING FLY LEADER
Craig W. Olson, River Falls, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 1, 1974, Ser. No. 465,735
Int. Cl. A01k *91/00*
U.S. Cl. 43—42.72 **4 Claims**



1. A fly leader for use at the end of a fishing line for fly fishing, said leader comprising:
a butt section,
a tippet section, and
an elastic shock-absorbing section between said butt and tippet sections, said elastic section having the same stiffness to diameter ratio as said butt and tippet sections, an elastic limit less than the knotted break strength of said tippet section and a length and modulus of elasticity to provide a predetermined elongation within its elastic limit,
said leader being tapered from the free end of said butt section to the free end of said tippet section.

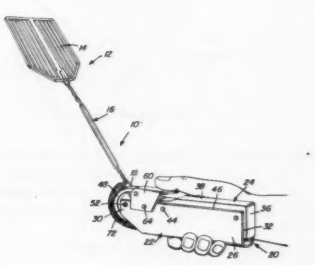
3,871,124
ANIMAL TRAP
Rodney G. Cook, P.O. Box 342, Camden, Ark. 71701
Filed Sept. 7, 1973, Ser. No. 395,053
Int. Cl. A01m *23/26*
U.S. Cl. 43—88 **14 Claims**

1. An animal trap comprising:
a. housing means,
b. resiliently biased closeable jaw means mounted on said housing means for grasping a portion of an animal,
c. selectively activatable first trigger means associated with said jaw means for permitting said jaw means to close,
d. resiliently biased release means mounted in said housing means for activating said first trigger means to permit said jaw means to close,
e. pressure activated second trigger means for activating said release means to activate said first trigger means,
f. said second trigger means including a pressure operated trip element mounted for vertical rectilinear movement,
g. said second trigger means further including means for



frictionally supporting said trip element in a raised position prior to the activation of said second trigger means.

3,871,125
MECHANICAL FLY SWATTER
Johnnie Wilson, and Robert F. Christensen, both of P.O. Box 846, Miles City, Mont. 59301
Filed Mar. 27, 1974, Ser. No. 455,325
Int. Cl. A01m *3/02*
U.S. Cl. 43—135 **19 Claims**



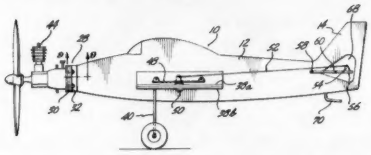
1. In combination with a swatter having a swat pad and a swatter arm extending therefrom and terminating in a pair of handle rods, a swatter operating mechanism comprising an elongated frame having a forward end portion, an anchor block enclosed by the frame in spaced relation to said forward end portion and secured to the frame, a pivot wheel rotatably mounted in said forward end portion of the frame and to which the swatter arm is connected, an actuating spring entrained about the pivot wheel having opposite ends respectively connected to the swatter arm and the anchor block, latch means engageable with the pivot wheel in a loaded position for holding the same under bias of the spring, and trigger means extending rearwardly from the forward portion of the frame in overlying relation to the anchor block for release of the latch means to permit rotation of the pivot wheel to an unload position under said bias of the spring.

3,871,126
MODEL AIRPLANES AND METHOD OF MAKING SAME
Edward A. Miller, 17807 S.E. 7th Pl., Kent, Wash. 98031
Filed June 22, 1973, Ser. No. 372,862
Int. Cl. A63h *27/00*
U.S. Cl. 46—78 **25 Claims**

1. A powered model airplane having an engine, fuselage,

wings, landing gear, rudder, elevator and elevator controls wherein the improvement comprises:

a. a wing made up of at least one layer of a corrugated material, having a corrugated core and a tightly adherent face sheet on either side,



b. an angular relationship between the engine and the wings wherein the wings are tilted backward about 0 to 2°, and

c. an essentially flat silhouette type fuselage and integral rudder made up of a double layer of corrugated material wherein the corrugations in each layer extend at an angle to each other.

3,871,127

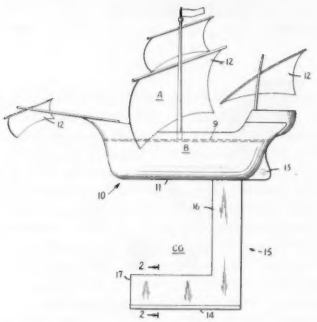
MODEL SAILING SHIP

Desmond Heath, 1230 Park Ave., New York, N.Y. 10028

Filed Jan. 4, 1973, Ser. No. 320,986

Int. Cl. A63h *23/02*

U.S. Cl. 46—93 **4 Claims**



1. A model sailing ship comprising a hull, at least one sail and a keel, the ship having a water center of pressure and a wind center of pressure, the hull having a deck, the keel being substantially L-shaped with a downwardly extending section attached to the rear of the bottom of the hull and a horizontally extending section attached to the bottom of the downwardly extending section and extending forward toward the bow of the ship, the wind center of pressure being positioned forward of the water center of pressure and the bottom of the keel being substantially the same distance below the deck as the top of the sail is above the deck, whereby increased stability is afforded for the model ship.

3,871,128

EYE CONSTRUCTION FOR SOFT STUFFED TOYS

George V. Grooms, Wayzata, Minn., assignor to Animal Fair, Inc., Minneapolis, Minn.

Filed Apr. 12, 1974, Ser. No. 460,305

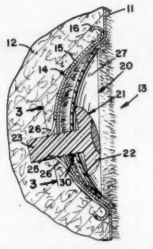
Int. Cl. A63h *3/38*

U.S. Cl. 46—165 **7 Claims**

1. An eye structure for a stuffed figure having a fabric covering comprising:

an eye simulation comprising a stud member having an enlarged head outside said covering and an inwardly extending stem passing through said covering;

and an eye socket simulation within said covering, comprising an outwardly concave cup member sized, relative to said head of said eye simulation, in the proportion of an eye socket to an eye, said socket simulation comprising an outwardly concave cup member having means in the bottom thereof for receiving and securing the stem of said eye simulation after it is passed inwardly through said covering so that said enlarged head engages the outside of said covering to draw the latter into said cup member, whereby to give the appearance of an eye naturally located in a recessed socket.



3,871,129

TOY CAR WITH AUXILIARY DRIVE WHEELS

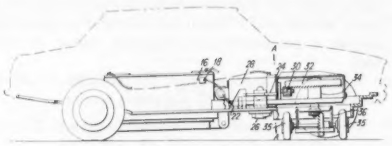
Duncan Tong, Hong Kong, assignor to Playart Limited, Hong Kong

Filed Jan. 26, 1973, Ser. No. 326,770

Claims priority, application Great Britain, Feb. 17, 1972, 07482/72

Int. Cl. A63h *17/36, 33/26*

U.S. Cl. 46—244 R **15 Claims**



1. A battery operated toy vehicle comprising:

a body;

at least three wheels freely rotatably mounted on the body;

a retractable undercarriage secured to said body and selectively movable between an operative and an inoperative position;

at least one driving wheel mounted on the undercarriage for movement therewith,

a motor mounted in the body and drivingly coupled to said at least one driving wheel;

a switch for connecting said motor to said battery; and

means moving said undercarriage to its operative position and concurrently closing said switch and to its inoperative position and concurrently opening said switch.

3,871,130
PLANT HUSBANDRY

Harry F. Lavo, Stamford, Conn., and Charles J. Cante, Bayside, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 298,752, Oct. 18, 1972, abandoned, which is a division of Ser. No. 134,865, April 16, 1971, Pat. No. 3,713,404. This application Dec. 14, 1973, Ser. No. 425,024

Int. Cl. A01n *17/06*

U.S. Cl. 47—9 **4 Claims**

1. In the application of plant agents to planted areas utilizing a garden hose coupled to a residential water supply providing a stream of water at a static pressure of about 15 to about 70 psig. the improvements comprising

introducing said stream of water to a foam generation zone;

educting into said stream by a venturi arrangement from a separate source a foam concentrate containing at least one foaming agent and at least one plant agent;

mechanically agitating the mixture and controlling the proportion of water and foam concentrate to maintain a dilution ranging from about 15 to about 90 parts by volume of water to each part of concentrate; and

thereafter directing the thus formed foam-providing solution against a foraminous barrier through which a current of air is simultaneously and unidirectionally forced,

whereupon the solution is spumed for application into a deformable foam.

3,871,131
SELF-WATERING PLANT POTS OR RECEPTACLES

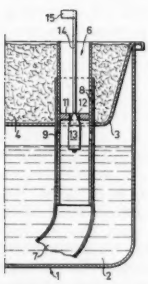
Jan Berglund, Mullsjo, Sweden, assignor to AB Husqvarna Borstfabrik, Husqvarna, Sweden

Filed Dec. 26, 1973, Ser. No. 427,859

Claims priority, application Sweden, Jan. 4, 1973, 73001059

Int. Cl. A01g *27/00*

U.S. Cl. 47—38.1 **6 Claims**



1. In a so called self-watering plant pot or receptacle, a reservoir for a nutrient liquid, such as water, a container for soil and plants therein which is located substantially entirely above the liquid surface in the reservoir, at least one tube which extends through the soil in direct engagement therewith and has its lower end projecting down into the reservoir for the supply of liquid to the reservoir and a liquid absorbent and transporting hose or sock, which is drawn upon the outside of the liquid supply tube for transferring liquid from the reservoir to the soil in the container.

3,871,132
SEED TABLET

Edwin H. Brink, deceased, late of Joliet, Ill., (by Robert R. Brink, Administrator), assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 20, 1973, Ser. No. 389,761

Int. Cl. A01c *1/06*

U.S. Cl. 47—57.6 **1 Claim**

1. A high strength seed tablet comprising one or more seeds encased in a mixture of dextrin binder with a pH value of about 3, vermiculite and water, the water content being at least about 12% by weight in the wet mixture, the ratio of vermiculite to binder being approximately 20:1, and the mixture being compressed about the said seed so that the original compressed mixture is reduced in volume by a factor of no more than 3 1/2-1.

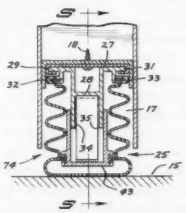
3,871,133
DOOR BOTTOM WEATHER SEALING STRUCTURE

Chester W. Ellingson, Jr., 13909 Frontier La., Burnsville, Minn. 55337

Filed Jan. 14, 1974, Ser. No. 433,400

Int. Cl. E06b *7/20*

U.S. Cl. 49—308 **7 Claims**



1. A door bottom weather sealing structure in connection with a door, having in combination:

door mounting means,

a first channel member carried by said door mounting means,

a second channel member interfitting with said first channel member,

means operatively connecting said first and second channel members for an extension and retraction of the same relative to one another,

a flexible accordian-like gasket overlying the side walls of said channel members,

a lower portion of said gasket enclosing the bottom of said second channel member,

an upper portion of said gasket having sealing engagement with said first mentioned channel member, and

said gasket being extensible and retractable responsive to extension and retraction of said channel members relative to one another.

3,871,134
TRANSLATING GATE LATCH

George O. Lening, Rowland Heights, Calif., assignor to Master Fence Fittings Inc., La Habra, Calif.

Division of Ser. No. 156,320, June 24, 1971, Pat. No. 3,751,084. This application Mar. 16, 1973, Ser. No. 341,893

Int. Cl. E05d *13/02*

U.S. Cl. 49—425 **1 Claim**

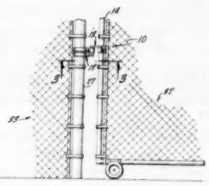
1. A fence having an opening and being erected above a horizontal surface, said fence comprising:

a. a first vertical member positioned adjacent one extremity of said opening in said fence;

b. a gate capable of blocking said opening by being translated across said opening, said gate including a second vertical member at one extremity of said gate;

c. a wheel mounted on said gate adjacent the lower end of said second vertical member, said wheel in rolling contact with said surface in said opening during said translation of said gate, said wheel being the sole support of said gate adjacent said second vertical member, said gate being susceptible to lateral misalignment from said extremity of said opening in said fence when said gate has been rolled across said surface on said wheel to a closed position; and

d. a latch for use in securing said translating gate in a closed position to block said opening in said fence by coupling said first vertical member at said extremity of



said opening of said fence to said second vertical member at said extremity of said gate, said latch comprising;

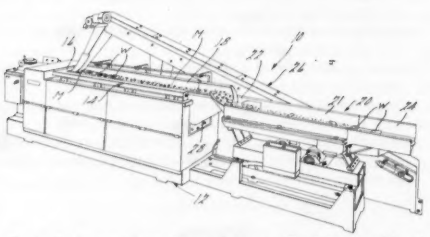
1. a latch pin mounted on one of said first and second vertical members;
2. a hollow receiver adapted to interconnect with said latch pin, said hollow receiver mounted on the other of said vertical members;
3. means for mounting one of said latch pin and said hollow receiver for rotation about a vertical axis and for vertical reciprocation so that said gate may be secured when said second vertical member is misaligned laterally from said first vertical member; and
4. means for stationarily mounting the other of said latch pin and said hollow receiver.

3,871,135

DISCHARGE CHUTE FOR VIBRATORY FINISHING MACHINE

Gordon H. Anderson, Albert Lea, Minn., assignor to King-Seely Thermos Co., Ann Arbor, Mich.

Filed Oct. 17, 1972, Ser. No. 298,426
Int. Cl. B24b *31/06, 31/12*
U.S. Cl. 51—163 **14 Claims**



8. A discharge chute for a vibratory finishing machine including a downwardly inclined finishing chamber and vibratory means for imparting movement in a generally elliptical path transverse of the longitudinal axis of the chamber,

said chute comprising a series of longitudinally arranged step-like elements adapted to impart an upwardly directed force on workpieces and finishing media moving into engagement therewith,

each of said elements comprising a generally vertical forward portion facing toward the direction from which said workpieces and media are moving, and a substantially horizontally disposed portion extending in the direction of movement of said workpieces and media from the forward portion of the associated element to the forward portion of the next adjacent element,

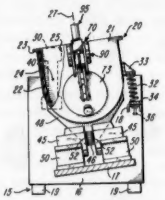
said substantially horizontally disposed portion extending slightly downwardly from the forward portion of the associated element toward the next adjacent downstream element.

3,871,136

VIBRATORY APPARATUS WITH IMPROVED MOTOR ACTUATED DOOR MECHANISM FOR CLOSING THE DISCHARGE OUTLET

Max Isaacson, Dayton, Ohio, assignor to Vibrodyne, Inc., Dayton, Ohio

Filed Mar. 14, 1974, Ser. No. 450,975
Int. Cl. B24b *31/06*
U.S. Cl. 51—163 **11 Claims**



1. In vibratory apparatus including a frame, a container defining a chamber adapted to receive a load of media and parts to be vibrated, means mounted on said frame and supporting said container for vibration, power operated means for vibrating said container with sufficient force to effect generally orbital movement of the load within said chamber, and said container having a wall defining an outlet to provide for the discharge of treated parts from said chamber, an improved door system for said outlet, comprising a door member, means supporting said door member for movement between a closed position forming a closure for said outlet and an open position spaced from said outlet, a reversible electric motor drive unit having a rotary output shaft, means for moving said door member between said open and closed positions in response to rotation of said shaft and for holding said door member in said closed position in response to energization of said motor in a stalled condition.

3,871,137

SAFETY HOLDER FOR ELECTRICALLY POWERED HAND GRINDERS

Stephen A. Grammatico, 112 Fairfield St., New Haven, Conn. 06515

Filed July 8, 1974, Ser. No. 486,699
Int. Cl. B24b *41/00*
U.S. Cl. 51—166 R **5 Claims**

1. A safety holder device intended for use with electrically powered hand held grinders for holding the grinders in a fixed stationary position, the holder comprising:

a C-shaped base member formed of flat stock material;

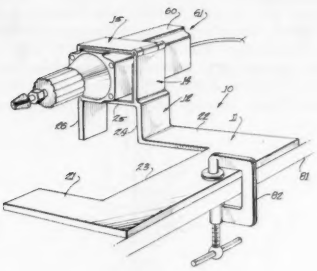
an inverted U-shaped member joined with one leg of the C-shaped base and extending outwardly therefrom;

a U-shaped bracket joined at its base with the bight portion of the inverted U-shaped portion and having side walls projecting normal to the plane of the C-shaped base;

an L-shaped locking plate including an integrally formed leg portion and arm portion, the leg portion being of a length to overlie the terminal ends of the bracket side walls, the arm portion being of a length to overlie a portion of the exterior surface of one of the side walls;

hinge means connecting the terminal end of the leg portion of the L-shaped locking plate to a terminal edge of one of

the bracket side walls providing pivotal movement of the locking plate in the plane of the bracket between a position spaced from the opposite side wall and a position engaging the opposite side wall; and



means for detachably securing the locking plate to the opposite side wall when the leg portion bridges the distance between the side walls and when the arm portion overlies one of the side walls.

3,871,138

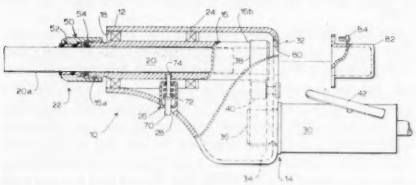
DIE GRINDER

Walter N. Welsch, Tonawanda, N.Y., assignor to Dynabrade Inc., Tonawanda, N.Y.

Filed Aug. 27, 1973, Ser. No. 391,686

Int. Cl. B24b *23/00*

U.S. Cl. 51—170 PT **11 Claims**



1. In a grinding tool adapted for use with an elongated relatively uniform diameter grinding element having an end adapted to be progressively worn away be engagement with a workpiece during operation of said grinding tool, the combination comprising:

a rotatably supported drive tube, said drive tube being dimensioned to freely accommodate said grinding element therewithin to removably extend through a front end thereof;

means for rotating said drive tube; and

locking means carried by said front end for releasably clamping said grinding element intermediate opposite ends thereof for rotation with said drive tube, whereby said end of said grinding element normally projects forwardly of said front end beyond said locking means during operation of said tool, said locking means including a deformable member formed or a resiliently deformable material and clamping means carried on said front end for resiliently deforming said deformable member into clamping surface engagement with said grinding element whereby to releasably clamp said grinding element for rotation with said drive tube, said clamping means including a cup shaped clamping member having an opening through a base portion thereof and sleeve means slidably receiving said grinding element and being arranged within said clamping member to extend forwardly through said opening, said clamping member having a rim portion threadably attached to said front end of said drive tube for releasably maintaining said sleeve means in deforming engagement with said deformable member, and said sleeve means being formed at least in part of a relatively hard abrasive-resistant plastic material thereby to cushion transversely directed vibratory movements of said end of said grinding element relative to said base portion of said clamping member forwardly of the point at which said grinding element is clampingly engaged by said deformable member.

3,871,139

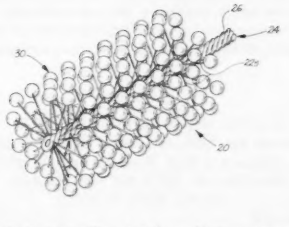
MULTIPLE-COMPLIANT-BRISTLE, SELF-CENTERING SELF-SIZING ROTARY ABRASIVE HONE

Steve A. Rands, 4353 E. Floral Dr., Los Angeles, Calif. 90022

Filed May 10, 1974, Ser. No. 468,940

Int. Cl. B24d *13/10*

U.S. Cl. 51—334 **14 Claims**



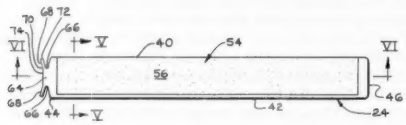
1. A multiple-compliant-bristle, self-centering rotary abrasive brush means having enlarged, abrasively coated, outer bristle tip ends of multi-phase material, comprising: a plurality of outwardly directed, flexible, plastic inwardly effectively compressible, elastically bendable bristles mounted in a substantially radially and cylindrically arranged array thereof and provided with and carried by a bristle-mounting base means, each of said bristles being formed of flexible, resiliently elastically bendable, compliant non-metallic plastic material having corresponding exteriorly completely uncoated, flexible, compliant shaft portions made of said plastic material and having a free outer end of said plastic material positioned with respect to the corresponding outer ends of the other bristles in a substantially cylindrically oriented array thereof and there being provided with and being coated with outer coating means effectively defining an enlarged abrasive globule carried thereby and effectively forming an outer terminus of composite multi-phase material comprising the bristle tip end and said enlarged abrasive globule, said enlarged abrasive globule comprising a particulate abrasive material and a wear-attritionable, hardenable and curable plastic resin bonding material for effectively bonding the particulate abrasive material into a globule-like assembled formation of a non-flaking, wear-attritionable nature, the outer tip end of each of said bristles carrying a corresponding one of said enlarged abrasive globules being effectively provided on its plastic outer surface and inwardly of said wear-attritionable plastic resin bonding material in an effectively intervening position therebetween with a junction-facilitating, effective bonding surface means having a great junction affinity for the exterior surface of said outer tip end of each such bristle and having a great junction affinity for the inner surface of said wear-attritionable bonding material and thereby functioning as an effective intervening joining bridge means between the surface of the outer tip end of each such bristle and the inner surface of the corresponding wear-attritionable bonding material and of greater junction strength than either of the plastic materials effectively joined together in a bridging manner by said junction-facilitating, effective bonding surface means whereby to positively prevent flaking away of pieces of substantial size of the abrasive globule during hard honing, abrading usage thereof against a workpiece surface, comprising an inner surface of substantially

cylindrical configuration, which is harder than said wear-attritionable bonding material and softer than said particulate abrasive material; said effective bonding surface means comprising a junction-adhesive material having strongly adhesive junction characteristics insofar as the outer bristle tip ends formed of said flexible resilient plastic material are concerned and having strongly adhesive junction characteristics insofar as said wear-attritionable plastic resin bonding material is concerned; each of said enlarged abrasive globules being carried by the radially, substantially cylindrically arranged array of bristles so as to position the plurality of abrasive globules in an annularly cylindrically arranged array thereof with each inner portion of each bristle inwardly of the outer abrasive globule means comprising a major portion of the length of said bristle being substantially entirely free of said outer coating means comprising said abrasive material and said bonding material and also being substantially entirely free of said junction-facilitating, effective bonding surface means whereby to have substantially unaltered, free flexibility and compliance characteristics forming an inwardly deflectable and, thus, effectively self-sizing and self-centering, multiple-compliant-bristle rotary abrasive flexible hone for effectively honing a substantially cylindrical workpiece surface.

3,871,140
PLASTIC HONE STONE RETAINER

Carl H. Kramm, Pinckney, and Roger E. Lee, Brighton, both of Mich., assignors to RLK Research Inc., Brighton, Mich.

Filed May 16, 1973, Ser. No. 360,620
Int. Cl. B24b *33/08*
U.S. Cl. 51—338 **10 Claims**

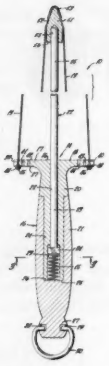


1. A hone stone and head assembly comprising, in combination, an elongated homing honing having a longitudinal axis defining an axis of head rotation during honing, a hollow center, an annular wall and an exterior surface, at least one radially extending elongated rectangular opening defined in said head annular wall intersecting said hollow center and said exterior surface, said opening including first and second radially extending end faces transversely disposed to the length of said opening, an abrasive stone assembly of elongated configuration mounted within said opening for radial displacement therein, said stone assembly including a synthetic plastic body having a bottom inner surface, first and second lateral sides, a top outer surface and first and second ends, a cavity defined in said body intersecting said top outer surface, an abrasive stone firmly mounted within said cavity, an elongated deflectible spring element defined on said body first end resiliently engaging said head opening first end face and deflected toward said stone in the direction of the length of said stone assembly thereby producing a biasing force on said stone assembly generally parallel to the length of said assembly, said deflectible spring element comprising an elongated cantilevered lip having an elongated free outer edge and an elongated fixed edge attached to said body first end, said lip edges extending in a longitudinal direction substantially radially disposed with respect to said head axis and substantially parallel to the direction of stone assembly movement through said opening, said spring element producing frictional engagement between said element and said first end face and said body second end and said second end face slidably retaining said stone assembly within said head opening, and stone assembly actuating means within said head hollow center engaging said assembly bottom inner surface for radially moving said stone assembly outwardly through said opening.

3,871,141
KNIFE SHARPENER AND EDGE STRAIGHTENER

Mario J. Bonapace, 4329 Miriam Pl., La Mesa, Calif. 92041

Filed May 14, 1973, Ser. No. 360,330
Int. Cl. B24d *17/00, 15/00*
U.S. Cl. 51—358 **8 Claims**



1. A knife sharpener and edge straightener comprising:
a partially hollow handle having a pair of ears extending laterally from opposite sides thereof;
an elongate rod, one end of said rod extending into said handle and being movable relative thereto;
means for applying an axial force to said one end of said rod;
an elongate flexible band having a fine grain abrasive surface on one side thereof, the opposite ends of said band being connectable to said ears on said handle; and
guide means connected to the other end of said rod for conducting the center of said band around said other end of said rod, with said one side facing outward, thereby compressing said force applying means and placing said band under tension, said force applying means permitting axial movement of said other end of said rod toward said handle in the presence of additional tension applied to said band.

3,871,142
DEVICE FOR HOLDING DOWN MOBILE HOMES

Donald W. Abbott, Des Moines, Iowa, assignor to Windtie Corporation, Des Moines, Iowa

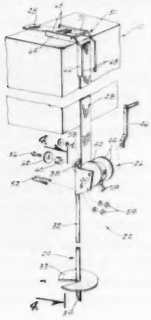
Filed June 18, 1973, Ser. No. 371,263
Int. Cl. E04h *9/14*
U.S. Cl. 52—23 **2 Claims**

1. A hold-down device for anchoring a mobile home to the ground, said mobile homes having a top, opposite walls extending downwardly from the lateral edges of said top, and opposite ends, said hold-down device comprising:
a single elongated flexible strap extending over said top of said mobile home and having opposite ends extending vertically downwardly along said sidewalls of said mobile home,
said strap being of polyester material,
corner brackets being mounted at the corners of said mobile home where said sidewalls meet the edges of said top wall,
each of said corner brackets being L-shaped and having a horizontal leg positioned on said top of said mobile home and a vertical leg forming a corner juncture with said horizontal leg and extending downwardly therefrom in engagement with one of said walls of said mobile home,

each of said horizontal and vertical legs of said brackets having lateral flanges,

each of said brackets having a roller extending between the flanges of said horizontal leg and being positioned adjacent said corner juncture,

said strap being slidably received between the flanges of said horizontal and vertical legs of said brackets and extending over said roller whereby said flanges maintain said strap in alignment over said bracket and said roller so that said strap is prevented from engaging the corners of said mobile home and so that tension in said strap may be easily transferred to the opposite ends thereof,



a pair of anchor elements anchored in the ground adjacent said opposite ends of said straps, said anchor elements comprising an elongated rod having helical blade means on the lower end thereof, said blade means being buried in the ground,

strap gripping means mounted on the upper end of each of said rods for securing said opposite ends of said straps to said rods,

at least one of said gripping means comprising a winch, said strap being wound around said winch, said winch having a handle for turning said winch to adjust the tension in said strap.

3,871,143

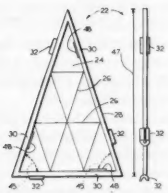
BUILDING ELEMENT FOR BEACH AND PLAY STRUCTURES

Elwyn B. Quick, Sudbury, Mass., assignor to Walter J. Kreske, Newton, Mass., a part interest

Filed June 27, 1973, Ser. No. 374,042

Int. Cl. E04c *1/10, 1/30*

U.S. Cl. 52—309 **12 Claims**



1. A building element for beach and play structures comprising in combination, a membrane having three sides and corners in the form of an isosceles triangle, a rod-like stiffener fixed to and completely circumscribing said sides and corners to form a rigid frame about said membrane and with said membrane a rigid unitary panel, said rod-like stiffener having on each of said sides two spaced apart configurations for spring clip type fastening and adjusting over a wide angular range to corresponding configurations on a rod-like stiffener of a like adjacent building element and thereby make possible rapid assembly and dissassembly of like building elements and a wide variety of said structures.

3,871,144

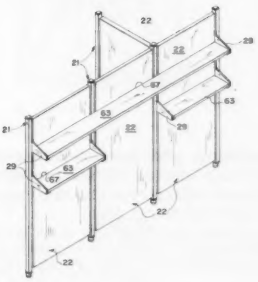
MODULAR ENVIRONMENT STRUCTURING APPARATUS

Melvin Rudin, Los Altos, Calif., assignor to Form/Space Corporation, San Francisco, Calif.

Filed Sept. 28, 1973, Ser. No. 401,862

Int. Cl. E04b *2/82*

U.S. Cl. 52—36 **6 Claims**



1. In a modular environment structuring apparatus including a tubular metallic post, panel means and connector means formed to secure said post to said panel means, the improvement comprising:

a. a plurality of rigid, high strength, metallic keyways formed in said post;

b. a plurality of rigid, high strength, metallic connector portions extending outwardly from a common metallic strip forming said connector means, said metallic strip being carried by said panel means;

c. said connector portions and said keyways being positioned in aligned and registered relation and formed for relative movement into and out of interengagement and being cooperatively formed to secure said connector portions in said keyways against removal therefrom under normal loading forces; and

d. said connector portions being further provided with spacer and load bearing means formed to engage said post means and said panel means and to hold the same in spaced apart relation adjacent said connector portions, said spacer and load bearing means being further formed for support of loading forces applied by a bracket inserted between said post means and said panel means adjacent said connector portion and for transfer of said loading forces to said high strength metallic keyways and the remainder of said connector means.

3,871,145

FLASHING FOR PITCH POCKET

James W. Hatmaker, 6400 Little River Tnpk., Alexandria, Va. 22313

Filed Apr. 5, 1973, Ser. No. 348,125

Int. Cl. E04d *1/36*

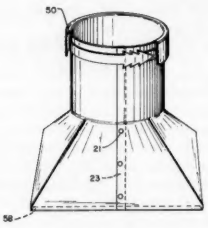
U.S. Cl. 52—60 **5 Claims**

1. A flashing unit for a pitch box comprising:

a sheet of shapable material having a collar portion adapted to be fitted so as to encircle structure support legs of varying circumferences which project upwardly from said pitch box,

said collar portion including an integral, circumferentially extending exterior pocket having a substantially inverted U-shaped cross-sectional configuration,

an elongate fastening element encircling said collar portion and having one end thereof secure to said collar portion at a position whereby said element is housed under and within said U-shaped pocket and including means disposed upon the other end thereof for cooperating with



said pocket for adjusting the effective circumferential extent of said fastening element and said collar portion whereby said collar portion may be tightly secured about one of said support legs, and

a flaring section attached to said collar portion and being adapted to engage the sides of said pitch box and including a lower portion which is adapted to be bent so as to fixedly secure said flaring section upon an upper rim portion of the pitch box.

3,871,146

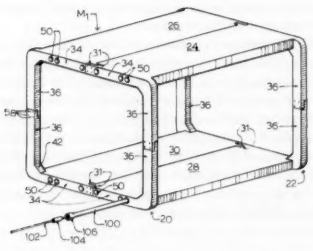
CONSTANT MODULE SYSTEM

Norbert Hamy, Beaconsfield, Quebec, Canada, assignor to Trebron Holdings Ltd., Regina, Saskatchewan, Canada

Continuation of Ser. No. 276,163, July 28, 1972, which is a continuation-in-part of Ser. No. 44,012, June 8, 1970, abandoned. This application Mar. 13, 1974, Ser. No. 450,745

Int. Cl. E04b *1/348;* **E04f** *17/08*

U.S. Cl. 52—79 **16 Claims**



1. A hollow generally rectangular modular construction unit constructed with a plurality of generally similar end frames which are joined together to form the generally rectangular modular construction unit, said modular construction unit comprising:

a. a first pair of opposed spaced-apart generally parallel end frame segments,

b. a second pair of opposed spaced-apart generally parallel end frame segments,

c. each of the end frame segments in said first pair of segments being substantially identical in construction to the end frame segments in said second pair of end frame segments,

d. each of said end frame segments comprising;

1. a first limb,

a. said first limb having a pair of spaced-apart plates,

b. extension means connecting said plates together in said spaced-apart relationship,

c. means forming an elongated slot at one end of said first limb between said plate,

d. one of said spaced-apart plates having an outwardly presented first connecting end wall,

e. the other of said second-apart plates having an outwardly presented second end wall,

2. a second limb at a mutually angled relationship with respect to said first limb,

a. said second limb having a plurality of angularly located side walls forming a hollow tubular member,

b. projection means extending outwardly from the plane of one of said side walls and being sized for snug fitting disposition within the slot in said first limb,

e. said first pair of said end frame segments being capable of being joined together to form a first end frame,

f. first connecting means for connecting the first pair of end frame segments together to form the first end frame,

g. said second pair of end frame segments being capable of being joined together to form a second end frame,

h. second connecting means for connecting the second pair of end frame segments together to form the second end frame,

i. said first and second end frames capable of being joined together to form a generally rectangular modular unit,

j. third connecting means for connecting the first end frame to the second end frame to thereby form said generally rectangular modular unit,

k. a first generally rectangular base member for use with said first end frame,

l. a second generally rectangular base member for use with said second end frame,

m. each of said base members being substantially identical in construction and

1. each said base member having first and second pairs opposed and generally side margins,

2. each said base member also having a first generally planar major surface,

3. each said base member further having a second generally planar major surface opposed to said first major surface,

n. first securement means for connecting each of the first pair of side margins of the first base member to the respective connecting end walls of the first pair of end frame segments in the first end frame,

o. second securement means for connecting each of the first pair of margins of the second base member to the respective connecting end walls of the second pair of end frame segments in the second end frame,

p. the connecting walls of the end frame segments in each said pair of end frames being located in abutting engagement with each of the respective first pair of side margins of the associated base members,

q. the end frame segments in each of said pair of end frames extending outwardly and in generally perpendicular relationship to the opposed planar major surfaces of the associated base members,

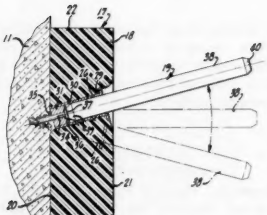
r. said first and second base members each having one of their margins in the second pair of parallel side margins in juxtaposed abutting engagement when the first and second end frames are connected together, and

s. the first generally planar surface of each of said first and second base members are coplanar and generally coextensive when the first and second end frames are connected together.

3,871,147
REUSABLE LEDGER BOARD WITH A NAIL-LOOSENING MEANS

William J. Stegmeier, 1021 C Shary Cir., Concord, Calif. 94520

Filed Jan. 29, 1973, Ser. No. 327,671
Int. Cl. E04g 19/00, 21/00
U.S. Cl. 52—127 10 Claims



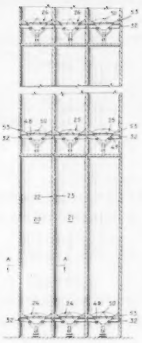
1. A reusable ledger board adapted to be removabiy secured to a concrete wall and the like, comprising: an elongated block of elastomeric material having an upper surface defining a planar reference surface, and transversely spaced inner and outer surfaces the first of which is adapted to be disposed in contiguous juxtaposition with such wall; said block having a plurality of longitudinally spaced and transversely oriented openings therein extending essentially between said faces; and fastener mechanism including guide structure mounted within each of said openings having an axially extending guide passage open at its outer end adjacent the outer surface of said block adapted to slidably receive an anvil therein and an aperture adjacent its inner end to pass the shank of a nail therethrough as it is driven into such wall by impact force transmitted through an anvil received within said passage, said guide structure being laterally rockable against the resilience of said block to loosen such nail from the concrete wall and thereby release said ledger board therefrom.

3,871,148
GRAIN HOPPER STRUCTURE

Robert George Watson, 95 Glengowan Rd., Toronto, Ontario, Canada

Filed Jan. 30, 1974, Ser. No. 437,856
Int. Cl. E04h 7/22
U.S. Cl. 52—197 7 Claims

1. A rigid bin structure for use in storing grain and the like which comprises: a base; a substantially continuous load-bearing wall extending upward from said base to define a hollow cylinder; a first series of spaced apart horizontal beams extending transversely in parallel across said cylinder and secured in opposed portions of said cylinder wall; a second series of spaced apart horizontal beams extending horizontally and normally to said first series of beams and secured to adjacent outer ones thereof; a ring beam extending around the inner periphery of said cylinder to circumferentially secure said first and second beams, hopper means dependingly supported by said beams; and baffle means mounted between said individual hoppers to guide the flow of said grain thereto; said

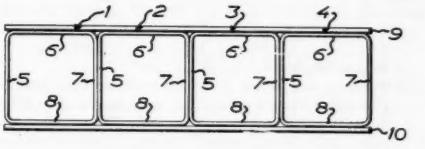


beams, baffle and hopper means being in substantially zero hoop-tension relationship with said wall.

3,871,149
STIFFENING MEANS FOR STRUCTURAL ELEMENTS

Hans Christer Georgii, Stockholm, Sweden, assignor to Gorghild Georgii, Geneva, Switzerland

Filed Oct. 3, 1973, Ser. No. 402,963
Claims priority, application Sweden, Oct. 4, 1972, 12777/72
Int. Cl. E04c 3/08, 5/06
U.S. Cl. 52—404 14 Claims



1. Stiffening means for structural elements, said means being formed by helically wound wires, wherein the wires are wound in several different paths with several wires in each path, each path following the contour of a section having straight sides and the wire portions in said sides constituting straight braces, and wherein the sections having the straight sides are arranged in such an adjacent relationship that adjoining sides will engage each other, the straight wires in adjoining sides being interconnected at coincident points.

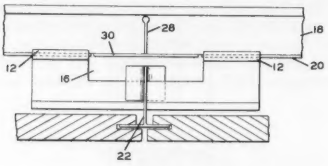
3,871,150
REMODELING CEILING CLIP

Jay P. Murray, Columbia, and Kenneth L. Wasson, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 317,668, Dec. 22, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 452,000
Int. Cl. E04b 5/55
U.S. Cl. 52—498 2 Claims

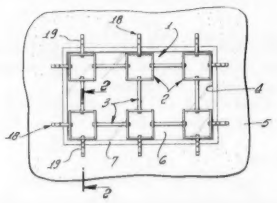
1. A clip structure adapted to be fastened to an existing ceiling suspension system comprising a vertical web structure and a lower horizontal flange structure, on the end of the web structure which is spaced from the flange structure there being positioned means for engaging a flange of an existing ceiling suspension system to hold the clip structure relative to the flange of the existing ceiling suspension system, a new ceiling suspension member being then fastened to the lower horizon-

tal flange of the clip structure whereby a horizontal flange of the new ceiling suspension member may serve as a resting



point for the boards of a new suspended ceiling system which is disposed directly underneath of the existing ceiling suspension system.

3,871,151
WINDOW OPENING PROTECTIVE GRILL
Estephan Der Estephanian, 2452 Boulder Rd., Altadena, Calif. 91001
Continuation of Ser. No. 181,843, Sept. 20, 1971, abandoned. This application Sept. 13, 1973, Ser. No. 396,900
Int. Cl. E04c *2/40*
U.S. Cl. 52—507 **7 Claims**

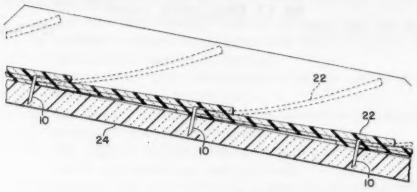


1. In combination:

A building wall having a window opening; and protective grillwork structure comprising a vertically and horizontally extended alternating succession of generally rectangular open frame modules having opposed relatively small apertures in opposite side walls and generally straight elongated, rigid frame link modules interconnected therewith, said frame link modules having opposed terminal portions each comprising a laterally projecting shoulder inserted endwise into said frame apertures when said modules are in a relatively angularly disposed planes and engaged therewith, and stop means inwardly of said shoulder limiting shoulder insertion into said apertures, said shoulder and stop means being arranged relatively engaged with the frame side wall on opposite sides thereof in self-locking interengagement against movement in any direction when said frame modules and frame link module are in a common plane, said grillwork structure being dimensioned to overlie the window opening, and wall connection means securing the grillwork structure at said frame module aperture to the building wall at the window opening perimeter.

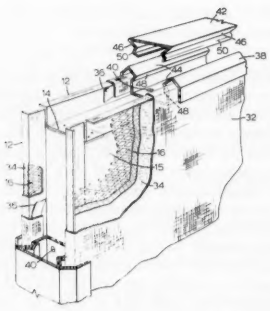
3,871,152
SPRING FASTENER
Richard Jay Lindeman, Elmwood Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Oct. 29, 1971, Ser. No. 193,763
Int. Cl. F16b *15/00*
U.S. Cl. 52—543 **6 Claims**

1. A staple fastener in combination with flexible shingle and a gypsum-like support surface including a head portion on the staple which includes a generally U-shaped cantilever-type spring means and a pair of legs having penetrating points connected thereto, the cantilever spring means engaging and holding one end of the resilient shingle in such a manner as to allow the free end to flex, the cantilever spring means thereby resiliently absorbing forces tending to pull out the staple as



well as forces tending to rip the shingle from under the staple, the leg portions being of a relatively thin planar cross-sectional configuration to facilitate entry in the gypsum-like support surface without deteriorating the structure of the gypsum-like support surface.

3,871,153
PARTITION DEVICE
Herbert L. Birum, Jr., Pleasant Valley, Titusville, N.J. 08650
Division of Ser. No. 188,290, Oct. 12, 1971, Pat. No. 3,768,222. This application June 18, 1973, Ser. No. 371,145
Int. Cl. A47g *5/00*
U.S. Cl. 52—624 **5 Claims**

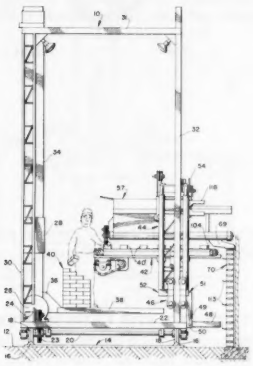


1. A privacy screen comprising a screen panel having a perimeter edge surface between opposed facia surfaces; perimeter moulding extending longitudinally of said edge surface and having rigid side walls in face-to-face relation; said side walls each having a longitudinally extending seat and a locking shoulder underlying said seat, a decorative moulding between said side walls of said perimeter moulding for at least a portion of the extent of said perimeter moulding, said decorative moulding having downwardly depending sides, said downwardly depending sides each having a longitudinally extending seating surface in one of said seats of said perimeter moulding and a locking flange extending from said seating surface in juxtaposed relation to one of said locking shoulders of said perimeter moulding; said dependent sides being flexible laterally of each other whereby said decorative moulding can be projected between said side walls of said perimeter moulding, said screen panel comprising perimeter frame members having a channel cross-section with an outwardly directed flange at each side, a panel board contained by said outwardly directed flanges, a facia fabric extending over said panel board, the marginal portions of said facia fabric extending over said outwardly directed flanges and on to said perimeter frame members, said perimeter moulding being mounted in said channel.

3,871,154
AUTOMATIC SCAFFOLDING FOR LAYING BRICK

Hilary H. Iglehart, and Richard C. Lassiter, both of Odessa, Tex., assignors to Trojan Automatic Scaffold, Inc., Odessa, Tex.

Filed June 26, 1973, Ser. No. 373,645
Int. Cl. E04g *21/00*
U.S. Cl. 52—749 **9 Claims**



1. Automatic scaffolding for laying brick comprising a ground supported main framework having spaced vertical support mans; means by which said scaffolding can be moved longitudinally of a wall being built of the brick; elevator means supported for vertical movement within said main framework for transporting brick placed thereon; means for moving said elevator means in a vertical direction;

carrier means slidably affixed to said vertical support means and supported for vertical movement thereon;

a longitudinally extending support beam attached to said carrier means; means releasably affixing said carrier means to said vertical support means in captured relationship therewith; means by which said elevator means can move independently of said carrier means and to a position above and to a position below said carrier means; means by which said carrier means can be selectively engaged and moved by said elevator means;

a work platform located externally of said main framework; spaced arms affixed to said longitudinally extending support beam and to said work platform for supporting said platform from said carrier means;

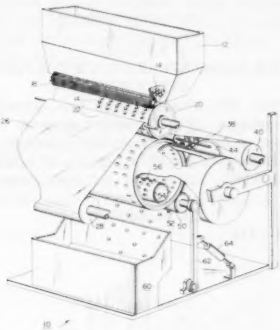
so that said work platform can be vertically adjusted by engaging said carrier means with said elevator means, releasing said carrier means from said vertical support means, moving said elevator which moves said carrier means which moves said platform, and thereafter affixing said carrier means to said vertical support means and disengaging said carrier means from said elevator means.

3,871,155
APPARATUS AND METHOD FOR WRAPPING CONFECTIONERY ARTICLES

Alfred Blaser, Hergiswil, Switzerland, assignor to W. R. Grace & Co., New York, N.Y.

Filed July 11, 1973, Ser. No. 378,300
Int. Cl. B65b *9/02*
U.S. Cl. 53—28 **7 Claims**

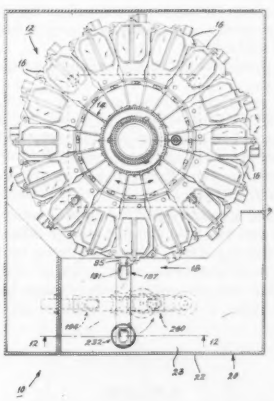
1. A method for wrapping articles of confectionery, said method comprising supplying articles of confectionery to a cylindrical article segregator from a supply, directing a continuous first sheet of heat sealable wrapping material over one side of the segregated articles while on said cylindrical segregator, passing said articles from the segregator while in continued contact with the first sheet to a receptacle drum having confectionery article receiving receptacles disposed therein, said first sheet being layered onto the receptacle drum, passing a second sheet of heat sealable wrapping material over the opposite side of the confectionery articles to that of said first sheet, heat sealing the wrapping sheets about the article along a periphery thereof, subsequently severing the encased articles from the wrapping sheets and thereafter remaining wrapped articles from the receptacle drum.



3,871,156
PELLETIZED MEDICAMENT DISPENSING SYSTEM

Elmer A. Koenig, Kirkwood, Mo.; Robert M. Conklin, Chappaqua, N.Y.; Walter L. Bessinger, Grand Haven, Mich., and Jack A. Russell, Libertyville, Ill., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Apr. 3, 1974, Ser. No. 457,676
Int. Cl. B65b *57/20*
U.S. Cl. 53—59 R **14 Claims**



1. A dispensing system for dispensing a predetermined number of designated medicament pellets comprising a plurality of movable medicament pellet storage units each adapted to contain different types of medicament pellets, means for moving said storage units to position a selected one of said units containing said designated pellets at a packaging station, each of said units including a bowl having an outlet for discharging pellets therefrom, means for positioning an open

container adjacent said outlet for receiving pellets from the bowl, means located at the packaging station for effecting discharge of the pellets through the outlet and into the container, means for counting the discharged pellets, means for terminating the discharge of pellets when said predetermined number is discharged, and means for closing the container.

3,871,157

BAG PACKAGING APPARATUS WITH PROTECTIVE ATMOSPHERE

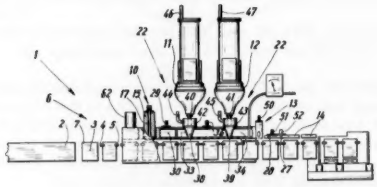
Klaus Domke, Hirschlanden; Peter Lau, Asperg, and Willi Glas, Renningen, all of Germany, assignors to Fr. Hesser Maschinenfabrik AG, Stuttgart-Bad Cannstatt, Germany

Filed Sept. 4, 1973, Ser. No. 394,064

Claims priority, application Germany, Sept. 1, 1972, 2243074

Int. Cl. B65b *31/04*

U.S. Cl. 53—110 **4 Claims**



1. Packaging apparatus having work stations for filling, measuring, and closing packaging containers, including flat form bags, in a protective atmosphere, comprising:

hood means extending over a plurality of work stations and including a plurality of regions with each region being adapted to receive independently of the other regions a controlled flow of protective gas;

said hood means further including a plurality of gas distributing chambers with each thereof being located in one or more of said regions;

a separate protective gas supply conduit connecting to each said region;

protective gas storage means connected to the conduits;

gas flow control means between each individual conduit and said storage means whereby the quantitative flow of gas to a plurality of regions can be controlled;

a manifold or main gas line between said gas storage means and said individual conduits;

said main and secondary gas flow control means interposed between said manifold and said storage means, said main and secondary gas flow means both being responsive to a slowdown or temporary shut down of said apparatus whereupon said secondary gas flow means causes to act as a gas bypass to supply gas at reduced pressure to said regions.

3,871,158

AUTOMATIC SATIN BALL MACHINE

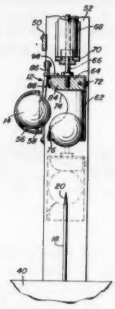
Salvatore J. Puleo, 435 Division St., Watchung, N.J. 07201

Filed Jan. 25, 1974, Ser. No. 436,685

Int. Cl. B65b *11/04*

U.S. Cl. 53—214 **10 Claims**

1. An apparatus for applying strand material to the external surface of a ball-shaped member comprising feed means providing a supply of ball-shaped members, a spindle having a free end onto which the ball-shaped members are inserted, means moving single ball-shaped members onto the spindle from the feed means, and flyer means oriented laterally of the



spindle to apply strand material to the external surface of the ball-shaped member during rotation thereof.

3,871,159

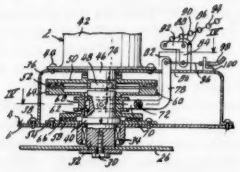
SAFETY DEVICE FOR LAWNMOWERS

Charles R. Shriver, 2828 N. 67th St., Kansas City, Kans. 66104

Filed Aug. 17, 1973, Ser. No. 389,252

Int. Cl. A01d *55/18*

U.S. Cl. 56—11.3 **4 Claims**



1. In a lawnmower including a base housing, a prime mover mounted on said housing and including a rotatably driven drive shaft, a blade operable to be driven by said prime mover, said blade being carried by a blade shaft mounted rotatably in said housing, coaxially with and below said drive shaft, and propelling means including a handlebar connected to said housing and having a hand grip adapted to be grasped by the operator, safety means comprising:

a. a first clutch disc fixed on said drive shaft concentrically therewith,

b. a first brake disc fixed in said housing concentrically with said shafts and spaced below said first clutch disc,

c. a spool member mounted on said blade shaft between said first clutch and brake discs, said spool member being axially slidable on said blade shaft but restrained against rotation relative thereto, and including at its upper end a second clutch disc engageable with said first clutch disc, and at its lower end a second brake disc engageable with said first brake disc, the spacing between the operative faces of said second clutch and brake discs being less than the spacing between the operative faces of said first clutch and brake discs,

d. resilient biasing means operable to urge said spool member downwardly whereby said brake discs are engaged and said clutch discs are disengaged, and

e. manually operable means operable to elevate said spool member against said resilient means whereby said brake discs are disengaged and said clutch discs are engaged, said manually operable means including a grip lever piv-

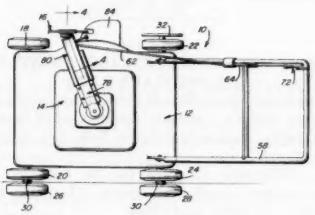
otally mounted on said handlebar adjacent said hand grip, said lever being adapted to be engaged and pivoted by the operator with the hand he uses to grasp said hand grip, whereby the lever is released, and the spool member is moved downwardly, whenever the operator releases said hand grip.

3,871,160

COMBINATION LAWN MOWER AND EDGER

Roy L. Hooper, 8 Highland Dr., Chickasha, Okla. 73018

Filed Sept. 20, 1973, Ser. No. 399,195
Int. Cl. A01d *35/12*
U.S. Cl. 56—16.9 **6 Claims**



1. In combination with a powered lawn mower having a frame and a power source, an edger assembly, comprising, in combination:

a. a blade;

b. means for adjustably, rotatably mounting the blade on the mower frame, the means for adjustably, rotatably mounting the blade including a sleeve affixed on the frame, a holder provided on the sleeve, an adjustment bracket adjustably arranged on the holder, a drive element connected to the adjustment bracket, the drive element is a pulley rotatably mounted on the adjustment bracket, and the blade connected to the drive element for rotation thereby; and

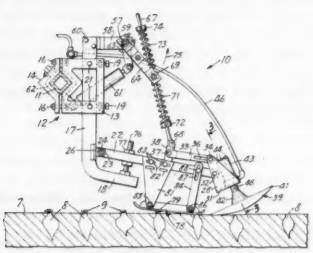
c. means connected to the blade and mower power source for rotating the blade, the means for rotating the blade including a stem adjustably mounted on the sleeve, a pair of idler pulleys rotatably mounted on the stem, and a belt arranged engaging the pulleys and with a pulley associated with the power source for transmitting torque from the power source to the pulley forming the drive element.

3,871,161

SCALPER UNIT

Fred W. Eisenhardt, c/o Alloway Manufacturing, 610 University, Fargo, N. Dak. 58102

Filed May 3, 1973, Ser. No. 356,842
Int. Cl. A01d *23/02*
U.S. Cl. 56—121.46 **29 Claims**



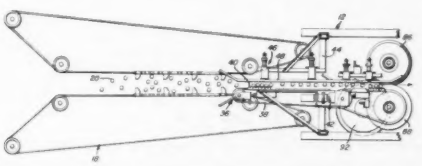
10. A scalper assembly for removing the top portion of a root crop in the ground comprising: a standard adapted to be attached to a beam; an elongated arm; means pivotally connecting the arm to said standard for movement toward and away from the surface of the ground; a support; means pivotally connecting the support to the arm; means to adjust and hold the pivotal position of the support relative to the arm; hydraulic motor means mounted on the support; and disc means connected to said hydraulic motor means whereby operation of said hydraulic motor means rotates the disc means to cut the top portion of the root crop as the disc means moves over the root crop.

3,871,162

SUGAR CANE HARVESTER

Isby L. Schexnayder, Jr., Jeanerette, and John W. Angers, New Iberia, both of La., assignors to J & L Engineering Company, Inc., Jeanerette, La.

Filed June 18, 1973, Ser. No. 370,644
Int. Cl. A01d *45/02*
U.S. Cl. 56—14.3 **6 Claims**



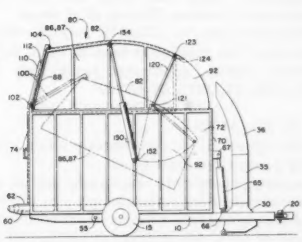
1. In a harvesting machine having a mobile frame adapted to be propelled in a forward direction along rows of crop stalks in the ground, means mounted on the frame in substantially fixed spaced relation to the ground for holding the stalks erect, cutter means for cutting the stalks adjacent the ground while held erect, means mounted in overlapping relation to the stalk holding means for rearwardly displacing the stalks severed by the cutter means, sectioning means for cutting the severed stalks into vertical sections as they are rearwardly displaced, support means on the frame operatively mounting the cutter means, the rearward displacing means and the sectioning means for simultaneous vertical adjustment relative to the stalk holding means, and flipper means rotatably mounted by said support means below the sectioning means for rewardly displacing severed stalk sections above the cutter means.

3,871,163

STACK FORMER AND COMPACTING STRUCTURE

Glenn G. Kanengieter, Blooming Prairie, and Daniel E. Peterson, Northfield, both of Minn., assignors to Owatonna Manufacturing Company, Inc., North Owatonna, Minn.

Filed Oct. 19, 1973, Ser. No. 407,906
Int. Cl. A01d *85/00*
U.S. Cl. 56—344 **12 Claims**



1. A stack forming and compacting structure comprising, a vehicle, a crop receiving container mounted on the vehicle, a

pick up means supported by the vehicle, a movable roof for the container having downwardly projecting side portions integral therewith, links means pivotally mounting the movable roof at four points thereon and to the upstanding sides of the container remote from the roof to move the roof through an arc in a direction having a horizontal and vertical component of a movement toward the confines of the container, said roof structure with the side portions formed integral therewith having a pivoted rear door and an open front face for introduction of material beneath the roof into the container.

3,871,164

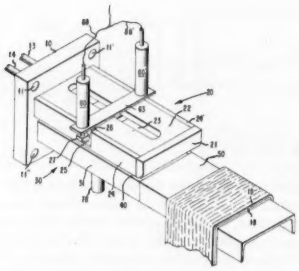
SPLICING APPARATUS

Gary Franklin Nunn, Lugoff, S.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 25, 1974, Ser. No. 454,419

Int. Cl. D01h *15/00*

U.S. Cl. 57—22 **4 Claims**



1. In an apparatus for splicing overlapped fiber tows wherein said overlapped tows are passed between opposed jet streams issuing from spaced jets facing each other, the improvement comprising: a support; upper and lower subassemblies cantilevered from said support defining a uniform slot there between; means for slidably mounting said spaced jets in said upper and lower sub-assemblies on either side of said slot for movement in unison toward and away from said support; and means adjacent each edge of the slot for releasably clamping the overlapping tows after they are inserted into and extended beyond each edge of the slot.

3,871,165

APPARATUS FOR CONTINUOUSLY SETTING WOOL SLIVER

Kazutomo Ishizawa, 3-80, Tomobuchico, 1-chome; Yasunori Nagata, 235, Nishishigino 3-chome, both of Osaka; Hirotaka Ito, 13-1, Shinmachi, Daito; Toyotaka Ishida, 13-11, Senrioka Higashi 1-chome, Settsu; Tohru Koide, 81, Fukae Kaguracho, Honjo-cho, Kobe, and Akio Sato, 13-1-72, Shiromachi 2-chome, Hikone, all of Japan

Division of Ser. No. 272,746, July 18, 1972, Pat. No. 3,803,826. This application Sept. 6, 1973, Ser. No. 394,932

Claims priority, application Japan, July 19, 1971, 46-53791; Feb. 22, 1972, 47-18749

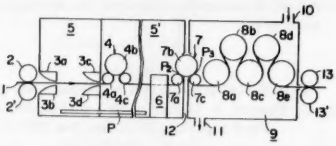
Int. Cl. D02g *1/00, 1/02*

U.S. Cl. 57—34 HS **4 Claims**

1. An apparatus for continuously seting wool sliver, comprising a series combination of:

a steaming chamber having an inlet and an outlet of a wool sliver and having a steam supply pipe within this chamber; a heating and false twisting chamber coupled to the outlet side of the steaming chamber and having a set of nipping rollers at the sliver-receiving side and at the sliver-delivery side of this chamber and having a false twister positioned intermediary of this chamber and having a steam supply pipe in this chamber, and

a drying chamber coupled to the sliver-delivery side of the heating and false twisting chamber and having a dry gas



inlet and an outlet for exhausting this gas from this drying chamber and having cylindrical drying roller means in this chamber.

3,871,166

DEVICE FOR IMPARTING FALSE TWISTS ON A FILAMENTARY YARN

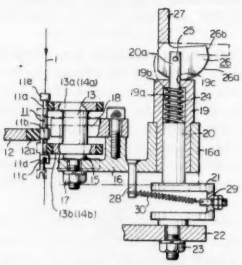
Shiro Murakami; Kenzi Kanda; Jiro Nakajyo, all of Matsuyama, and Makoto Yamasaki, Iwakuni, all of Japan, assignors to Teijin Limited and Teijin Seiki Co., Ltd., both of Osaka, Japan

Filed Mar. 12, 1974, Ser. No. 450,316

Claims priority, application Japan, Mar. 26, 1973, 48-36915; Nov. 20, 1973, 48-133240

Int. Cl. D02g *1/04;* **D01h** *7/92*

U.S. Cl. 57—77.45 **13 Claims**



1. In a device for imparting false twists on a filamentary yarn, provided with a false twisting spindle provided with a spindle head and a holding means which holds said spindle in rotatable condition and comprises a pair of holding rollers rotatably supported by a bracket in closely facing condition and attraction means for positioning said spindle in a wedge shaped space formed between said holding rollers in such a condition that said spindle is attracted toward said attraction means, said bracket is turnably mounted on a pivot shaft secured to a machine frame, an improvement comprising a driving system related to said false twisting spindle, a frictional driving means being capable of frictionally contacting at least two different portions of said driving system at predetermined different ratios of rotation, means for selectively changing said frictional contact of either one of said portions of said driving system with said frictional driving means under a pressure so that said driving system is driven at said predetermined ratio defined to said portion, means for urging said portion of said driving system to said frictional driving means by turning said bracket about said pivot shaft.

3,871,167

TURBINE CLOCKS

Gossem Hekmat Afshar, One Wellyn Rd., Bronxville, N.Y. 10708

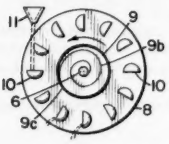
Filed May 22, 1973, Ser. No. 363,174

Int. Cl. G04b *45/00, 21/08*

U.S. Cl. 58—14 **6 Claims**

1. The turbine powered pendulum clock comprising, a turbine wheel, a source of liquid turning said turbine wheel, a

hairspring means, a shaft fixedly attached to one end of said hairspring, a drum means rigidly attached to said wheel and housing said hairspring; the other end of said hairspring being in frictional contact with the inside of said drum but free to slip therein; a rod means having two ends and a member having at least two parallel members thereon; said parallel members engaging said shaft means to be driven thereby;



clock hands, gear means for moving the said clock hands; a pawl means pivotally attached at a suitable point on the said rod means for transmitting motion from said rod means to the gear means for moving said hands, whereby said shaft is driven in circular motion by said liquid and said circular motion of said shaft means is transformed into oscillatory motion of said rod means via engagement of said shaft means with said two parallel members.

3,871,168

ELECTRONIC CIRCUIT FOR CORRECTION OF THE TIME DISPLAY ON AN ELECTRONIC TIMEPIECE

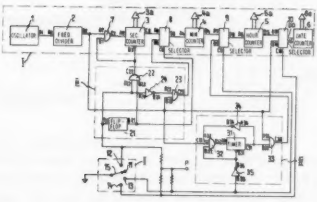
Pierre-Andre Maire, and Hubert Portmann, both of Saint-Imier, Switzerland, assignors to Compagnie des Montres Longines Francillon S.A., Saint-Imier, Switzerland

Filed July 31, 1972, Ser. No. 276,317

Claims priority, application Switzerland, Aug. 27, 1971, 12584/71

Int. Cl. G04c *3/00*

U.S. Cl. 58—23 R **9 Claims**



1. An electronically driven watch comprising a counting chain having an oscillator as a time-base connected to a divider for providing seconds pulses to drive a series of counters in sequence, setting means including a single commutator having an arm movable to a normal position contact and a plurality of setting position contacts, circuit means connected with said counters, said divider, and said setting position contacts of said commutator for applying the seconds pulses of said divider to selected ones of said counters in response to movement of said arm from said normal position contact to respective ones of said setting position contacts for individually changing the setting of corresponding ones of said counters, and delay means interposed between at least one of said setting position contacts and said circuit means for delaying the changing of the counter associated with said one position contact upon movement of said commutator arm past said one position contact.

3,871,169

TIMEPIECE

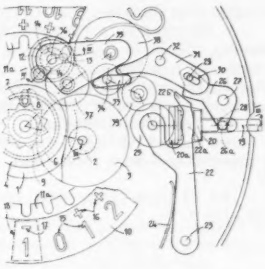
Edouard Schwaar, Bienne, and Andre Paroz, Brugg, both of Switzerland, assignors to Tavre Marc & Co. S.A., Bienne, Switzerland

Filed Nov. 12, 1973, Ser. No. 414,859

Claims priority, application Switzerland, Nov. 17, 1972, 16757/72

Int. Cl. G04b *19/22, 19/27*

U.S. Cl. 58—42.5 **3 Claims**



1. A time piece comprising, at least an hours indicator adapted to be moved step by step by a manually operable control mechanism, an indicator of the rank of a time-zone with respect to a reference time-zone, the rank indicator also being controlled by said control mechanism such that the displacements of the rank indicator are synchronized with those of the hours indicator when the hours indicator is operated manually by means of said mechanism, the control mechanism including a control stem moveable between several axis positions, in one of said positions the stem is adapted to operate the hours indicator and the rank indicator, whereby the rank indicator permanently indicates the difference between the time indicated by the hours indicator and the time of the reference time-zone.

3,871,170

SOLID STATE WATCH DISPLAY SWITCH

John M. Bergey, 1807 Mayflower Clr., Lancaster, Pa. 17603

Division of Ser. No. 354,192, April 25, 1973, Pat. No. 3,823,550, which is a continuation-in-part of Ser. No. 217,765, Jan. 14, 1972, Pat. No. 3,742,699, which is a continuation-in-part of Ser. No. 138,557, April 29, 1971, Pat. No. 3,782,102. This application Feb. 20, 1974, Ser. No. 444,146

Int. Cl. G04b *19/30*; **G04c** *17/02*

U.S. Cl. 58—50 R **6 Claims**

1. A wristwatch comprising a frequency standard for producing substantially constant frequency electrical signals, a frequency converter coupled to said frequency standard for producing corresponding electrical signals of lower frequency than said frequency standard, an electro-optical time display

for displaying time in decimal numbers, a display acuator coupling said frequency converter to said electro-optical time display, an electrical power supply terminal for energizing said time display from a power supply, and an arm responsive switch coupling said power supply terminal to said display whereby said display is energized upon a predetermined movement of a wearer's arm upon which said wristwatch is mounted, said arm responsive switch being responsive to variations in resistance.

3,871,171

MECHANISM FOR DRIVING A ROTATING JUMPING MEMBER IN A TIMEPIECE

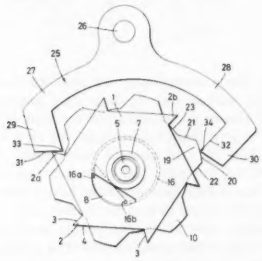
Adrien Maurice Charbonney, deceased, late of Saint Blaise, Switzerland (by Jean-Jacques Thorens, legal representative); Norbert Perucchi, Neuchatel; Michel Belot, Boudry, and Urs Giger, Solothurn, all of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Aug. 19, 1974, Ser. No. 498,428

Claims priority, application Switzerland, Aug. 20, 1973, 11958/73

Int. Cl. G04b *15/00, 19/02, 19/24*

U.S. Cl. 58—116 R **13 Claims**



1. A mechanism for driving a rotating jumping member in a timepiece, comprising a driving member rotating at a constant speed and coupled to said jumping member by a spring, a pallet pivoting about a fixed axis parallel to the common axis of said members, and a cam integral with said driving member and having a profile formed of lugs distributed at a uniform pitch about said common axis, said jumping member having teeth which are successively blocked and then released by said pallet in the course of the rotation of said jumping member, wherein said pallet comprises two beaks, each provided with a locking-plane and a tip, each locking-plane cooperating with said teeth and each tip cooperating with said profile, and wherein said locking planes are so oriented that the pressure of said teeth upon each of said planes subjects said pallet to a torque which causes it to pivot and to press against said profile.

3,871,172

PROCESS WITH FLUIDIZED COMBUSTOR AND FLUIDIZED HEAT EXCHANGER FOR AIR

John F. Villiers-Fisher, Kendall Park, N.J., and Edward T. Coles, Brooklyn, N.Y., assignors to Chemical Construction Corporation, New York, N.Y.

Filed Jan. 3, 1974, Ser. No. 430,543

Int. Cl. F02c *7/02;* **F02g** *5/00*

U.S. Cl. 60—39.02 **10 Claims**

1. A process for producing electrical power by the combustion of a carbonaceous fuel which comprises

a. introducing said carbonaceous fuel into an elevated pressure fluidized combustion zone, said fluidized combustion zone containing at least one bed of fluidized ash particles,

b. passing a first compressed air stream into said combustion zone, whereby said bed is fluidized and said fuel is burned in said fluidized bed to produce a substantially solids-free hot gas containing combustion products, and whereby ash from fuel combustion is agglomerated and added to said bed,

c. withdrawing said hot gas from said combustion zone,

d. passing hot solids from said fluidized combustion zone to a fluidized heat exchange zone,

e. passing a second compressed air stream into said fluidized heat exchange zone, whereby said second air stream is heated and said hot solids are cooled,

f. recycling the cooled solids produced by step (e) to said combustion zone,

g. expanding the heated second air stream through mechanical power recovery means, said mechanical power recovery means being connected with and driving an electrical generator, and

h. withdrawing electrical power from said electrical generator.

3,871,173

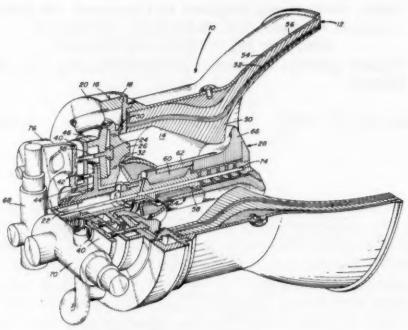
CONSTANT CHAMBER PRESSURE THROTTLING INJECTOR

Ronald F. McKenna, Rockford, Ill., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 24, 1970, Ser. No. 24,897

Int. Cl. F02k *9/02*

U.S. Cl. 60—258 **7 Claims**



1. A bipropellant rocket engine comprising an injector assembly and thrust chamber:

said injector assembly including an axially moveable annular deflector plate having two annular concave deflector surfaces in the thrust chamber over which propellants flow and are formed into circumferential sheets, and a central pintle coaxially arranged in said thrust chamber and being formed partially of pyrolytic graphite in order to withstand the high temperatures and pressures of combustion;

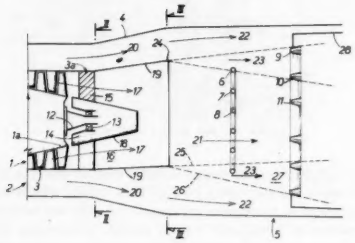
said thrust chamber including a combustion chamber and an exhaust nozzle; and

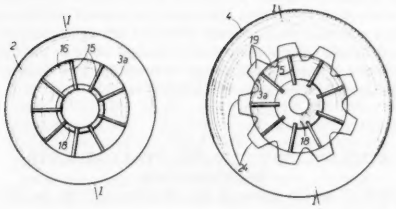
means to actuate said deflector plate and said pintle to vary the thrust of the rocket engine by simultaneously varying the propellant flow rate and the throat area of said exhaust nozzle in order to maintain the pressure in the combustion chamber constant for all degrees of throttling.

3,871,174
JET ENGINES

Marc Francois Bernard Buisson, Le Mee-Sur-Seine, and Herve Alain Quillevere, Issy-Les-Moulineaux, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d', Paris, France

Filed Apr. 24, 1973, Ser. No. 354,093
Claims priority, application France, Apr. 25, 1972, 72.14684
Int. Cl. F02k 3/10
U.S. Cl. 60—261 11 Claims





1. A jet engine comprising:

a. coaxial inner and outer casings bounding coaxial inner and outer duct means for an inner flow of hot gas and an outer flow of air flowing in said inner and outer duct means, respectively, at a given ratio of the velocity of the inner flow to the velocity of the outer flow;

b. disturbance generating means in at least one of said inner and outer duct means, which are effective to reduce said given velocity ratio in at least one first sector area of said at least one duct means, and to increase said given velocity ratio in at least one second sector area of at least one duct means adjoining said first sector area;

c. a confluence wall extending the inner casing beyond a downstream edge thereof to separate the outer flow from the inner flow;

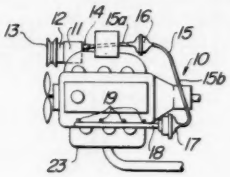
d. means forming an afterburner duct downstream of the confluence wall for receiving both said inner and outer flows flowing coaxially, including annular flame-holder means in the afterburner duct; and

e. corrugations in the confluence wall, extending from said downstream edge of the inner casing to a corrugated outlet edge of the confluence wall having an increased radius downstream of said first sector area, and a reduced radius downstream of said second sector area.

3,871,175
SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Yushi Yamamoto, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya-shi, Aichi-ken, Japan

Filed July 19, 1973, Ser. No. 380,677
Claims priority, application Japan, July 28, 1972, 47-89688; July 28, 1972, 47-89697
Int. Cl. F01n 3/10; F16k 15/02
U.S. Cl. 60—307 5 Claims



1. A secondary air supply system for use with an internal combustion engine having an exhaust system with means for purifying the engine exhaust gas comprising:

an intermittently operated air pump,

an air conduit interconnecting said air pump and exhaust purifying means,

a first check valve having a high blocking performance provided in said conduit adjacent said pump including a first valve member of elastic material, a first valve seat with portions of said first valve member opposing the valve seat and a first biasing means normally urging said first valve member into sealing engagement with said first valve seat, the air flow from said air pump deforming said first valve member against said biasing means to permit flow and back flow of exhaust gas deforming said valve member into sealing relation with said valve seat,

a second check valve having a high heat resistance provided in said conduit adjacent said purifying means including a second valve member made of heat-resistant and corrosion-resistant metal, a second valve seat made of heat-resistant and corrosion-resistant material and a second biasing means normally urging said second valve member and sealing engagement with said second valve seat said second valve member and second valve seat having a higher heat resistance and a lower blocking performance than said first valve member and first valve seat, respectively.

3,871,176
LARGE SODIUM VALVE ACTUATOR

Glen Elwin Schukei, South Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 8, 1973, Ser. No. 339,256
Int. Cl. F16k 31/12
U.S. Cl. 60—326 6 Claims

1. A valve actuator assembly driven by an electrically conducting working fluid for an electrically conducting fluid handling system, comprising:

a. a housing;

b. a vane assembly adapted to rotate within said housing;

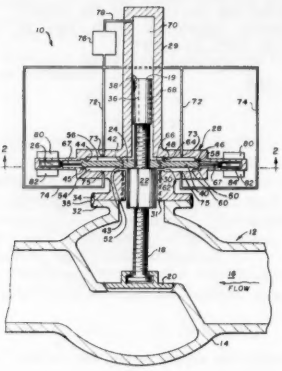
c. means suspending said vane assembly within said housing for allowing low friction rotation of said vane assembly;

d. power delivery means operably coupled to said vane assembly for utilizing said rotation;

e. a passage in said housing adapted to permit utilization of said rotation;

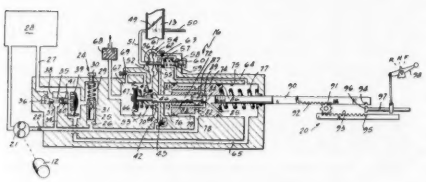
f. a passage in said housing adapted to permit the interchange of said electrically conducting fluid within said housing with said electrically conducting fluid of said fluid handling system; and

g. electromagnetic pumping means operating on said electrically conducting liquid surrounding said vanes for



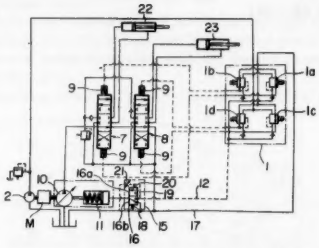
imparting a rotary motion to said liquid and thereby impelling said vane assembly into rotation.

3,871,177
CONTROL DEVICE FOR A HYDROSTATIC TRANSMISSION
Charles W. Ridlen, 1261 Bon Air Ct., Decatur, Ill. 62521
Filed Feb. 7, 1974, Ser. No. 440,493
Int. Cl. F15b *11/02*
U.S. Cl. 60—431 **20 Claims**



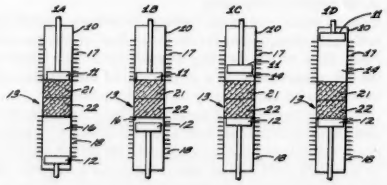
1. A control device for a transmission having a variable displacement pump driven by a prime mover having a power curve and a hydraulic motor comprising: first means sensing the load applied on the prime mover; second means for sensing the speed of the prime mover including pump means driven by the prime mover for developing a hydraulic pressure proportional to the speed of the prime mover, and compensating means for correcting for change in hydraulic pressure from the pump means in response to speed changes of the prime mover to follow a pressure-speed curve which is substantially similar to the power curve of the prime mover up to a maximum horsepower of the prime mover; a servo device having a housing containing a cylinder, a servo piston disposed in the cylinder and a pilot spool for controlling the application of fluid pressure to the servo piston; linkage means connecting the servo piston with the hydrostatic transmission to vary the ratio of the transmission in response to movement of the servo piston; and means for combining the output of the first and second sensing means for applying a control signal to the pilot spool whereby the ratio of the hydrostatic transmission is varied in response to changes in both the load and speed of the prime mover.

3,871,178
VARIABLE OUTPUT PUMP CONTROL CIRCUIT USING A REMOTE CONTROL
Hiroyoshi Tominaga, Osaka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Sept. 6, 1973, Ser. No. 394,664
Claims priority, application Japan, Oct. 31, 1972, 47-108463
Int. Cl. F16h *39/46*
U.S. Cl. 60—443 **2 Claims**



1. A variable output pump control circuit using a remote control valve for switching two control valves which control the operation of hydraulic actuators and also for switching a servo motor of a variable output pump, comprising control circuit means in a pilot circuit of said variable output pump for connecting said remote control valve with said servo motor, said control circuit means including: switching a control valve, having a first section for connecting the pilot circuit with said servo motor, a second section for blocking the pilot circuit and for connecting said servo motor with a drain circuit, and a spring means disposed at one end of the spool of the switching control valve to urge the spool to connect said second section with said drain circuit; a control passage means connected to said pilot circuit; and a throttle valve at the drain circuit side of the control passage for throttling flow to or from the other end of the switching control valve.

3,871,179
STIRLING CYCLE ENGINE WITH CATALYTIC REGENERATOR
Reginald B. Bland, deceased, late of Solvang, Calif. (by Maria A. Bland, administratrix)
Filed Mar. 13, 1974, Ser. No. 450,829
Int. Cl. F03g *7/03;* **F25b** *9/00;* **H02p** *9/00*
U.S. Cl. 60—526 **12 Claims**



1. In a Stirling engine having an expansion space; a compression space; a working fluid in said spaces; means for periodically transferring working fluid between the expansion space and the compression space; a heat source for adding heat to the working fluid adjacent the expansion space; a heat sink for removing heat from the working fluid adjacent the compression space; and a regenerator in the fluid flow path between the expansion space and the compression space, the improvement comprising:

a working fluid having components susceptible to reversible chemical reaction under the temperature and pressure conditions in the engine, said reaction having a greater

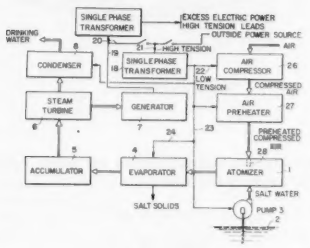
number of moles of fluid when the reaction proceeds in its higher temperature direction than when it proceeds in its lower temperature direction; and

a catalyst in the regenerator for enhancing the rate of the chemical reaction.

3,871,180
WATER DESALINIZATION SYSTEM

Joe B. Swanson, Inglewood, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 29, 1973, Ser. No. 419,958
Int. Cl. F01k *3/08, 15/00*
U.S. Cl. 60—648 **2 Claims**



1. A water desalinization system, comprising

atomizer means for atomizing salt water;

evaporator means for evaporating the atomized salt water to provide steam with a residue of solid salts;

accumulator means for accumulating the steam;

steam turbine means driven by the steam;

electrical generator means coupled to and driven by the steam turbine means for producing electric power, the atomizer means comprising air compressor means electrically connected to the electrical generator means for compressing air, preheating means for heating the compressed air and directing means for directing the preheated compressed air at right angles to the flow of salt water, the evaporator means comprising a vessel of substantially circular cross-section having a plurality of equiangularly spaced electrodes therein positioned substantially radially and spark producing means including high voltage transformer means electrically connected between the electrical generator means and the electrodes for producing high heat sparking between the electrodes in the vessel; and

condenser means for converting the steam to pure water after it drives the turbine means.

3,871,181
METHOD OF FORMING AN ENCLOSURE IN A BODY OF WATER

Leon B. DeLong, New York, N.Y., assignor to DeLong Corporation, New York, N.Y.

Filed Feb. 15, 1974, Ser. No. 443,156
Int. Cl. E02d *23/08;* **E02b** *1/00;* **E02d** *23/16*
U.S. Cl. 61—34 **6 Claims**

1. A method of forming an enclosure in a natural body of water having a marine floor, comprising the steps of:

positioning a bottom template member having a plurality of spaced caisson guide positioning openings, at an appropriate location in said body of water and resting on said marine floor;

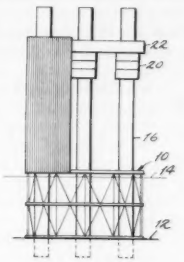
setting caissons in each of said plurality of openings;

driving the lower end portions of each of said caissons into said marine floor so as to have a substantial portion of said caissons extending above the surface of said body of water;

positioning lifting means in an operatively supported manner above said bottom template;

positioning a top template member having a plurality of spaced guide openings corresponding to said guide openings in said bottom template, on said caissons so as to be slidably disposed thereon and supported by said lifting means;

lifting said top template upwards on said caissons by means of said lifting means, an adequate height to permit a plurality of rigid sheet pile cells to be suspendably supportably secured at their upper portions to said top template while keeping the bottom portions of said piles out of contact with the surface of said body of water;



attaching said sheet pile cells to said top template so as to form a vertical walled enclosure;

lowering said enclosure and said top template so that the bottom of said enclosure rests on said marine floor, by means of said lifting means lowering said top template;

detaching said sheet pile cells from said top template and removeing said top template from said caissons;

driving the lower portion of said sheet pile cells into said marine floor;

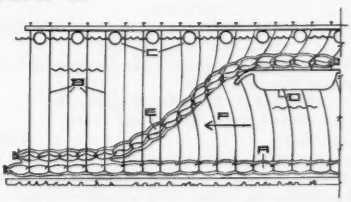
removing said lifting means and said bottom template from said caissons; and

removing said caissons.

3,871,182
METHOD OF PROTECTION FOR SLOPES AND CRESTS OF RIVERS, CHANNELS, AND THE LIKE

Jose Estruco, Blas Parera 691, Rosario, Argentina

Filed Nov. 5, 1973, Ser. No. 412,825
Claims priority, application Argentina, Nov. 9, 1972, 245070
Int. Cl. E02b *3/12*
U.S. Cl. 61—38 **1 Claim**



1. A method for the protection of slopes and crests of rivers, channels, and the like by guided mooring of flexible and permeable tubular casings of great length, filled with fresh concrete, said method comprising the steps of filling a first tubular casing with fresh concrete, mooring it by gravity to the desired position, simultaneously as it is being filled, by means of a series of ropes attached thereto leaving the ends of said ropes free subject to a floating element on the surface of the water, using said ropes as guides for other casings similar to said first

casing which are also moored by gravity while simultaneously being filled with fresh concrete, holding subsequently filled tubular casings to the first, the basis for alignment of said subsequently placed casings being ropes held by said first casing and said floating element on the surface of the water, whereby each of said tubular casings may be placed in the desired position.

3,871,183

ARCUATE TUNNEL LINING SEGMENTS

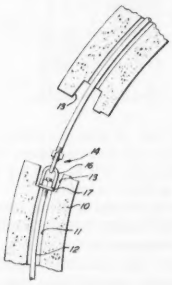
William Thomas Cardwell, Laleham; Francis Murray Hawke, Ashford, and Peter Gordon Gibson, Camberley, all of England, assignors to Charcon Tunnels Limited, Derby, England

Filed Aug. 10, 1973, Ser. No. 387,376

Claims priority, application United Kingdom, Aug. 15, 1972, 38071/72

Int. Cl. E01g *5/02*

U.S. Cl. 61—45 R **6 Claims**



1. An arcuate tunnel lining segment having at least one tie member extending circumferentially through and enclosed within the segment, at least one end of the tie member having an articulated coupling device for securing said end to a tie member of a further segment, which coupling device comprises a nut screwed on to said one end of the tie member, a first rigid U-shaped element the ends of which are secured to the nut on either side thereof and a second rigid U-shaped element interlinked with the first element and having a further nut secured between the ends thereof for screwing on to an end of a further tie member.

3,871,184

POSITION AND ANCHORING SYSTEM FOR OFF-SHORE DRILLING PLATFORM

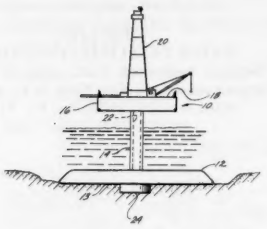
Joseph F. Schirtzinger, Pasadena, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Filed Apr. 8, 1974, Ser. No. 459,030

Int. Cl. E02b *17/00;* **E02d** *27/04*

U.S. Cl. 61—46.5 **4 Claims**

1. A drilling structure for drilling into the ocean floor from above the ocean surface, comprising a cellar having a bottom wall and sidewalls, the cellar being imbedded in the ocean floor and open at the top, a monopod drilling platform including a lower hull submerged below the surface, the lower hull having a flat bottom surface slidably engaging the top of the cellar sidewalls, a drilling platform positioned above the surface, a column supporting the platform on the submerged hull, and casing means extending from the bottom of the hull up through the column to the drilling platform, the casing means forming an open vertical passage extending from the drilling deck to the cellar, the passage being substantially smaller in cross-section than the bottom of the cellar, and means including a winch mounted adjacent the top of the column and a cable extending from the winch down through the passage and laterally from the bottom of the passage to the sidewalls of the



cellar for moving the hull relative to the cellar by tension applied to the cable by the winch.

3,871,185

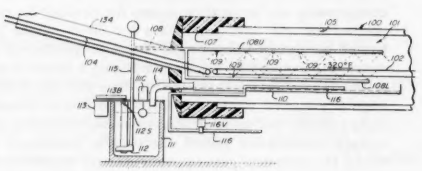
METHOD AND APPARATUS FOR FLASH FREEZING VARIOUS PRODUCTS

John D. Harper, Elgin; Frederick Breyer, Highland Park, and Richard C. Wagner, Clarenoon Hills, all of Ill., assignors to Integral Process Systems, Inc., Park Forest, Ill.

Division of Ser. No. 487,446, Sept. 15, 1965, Pat. No. 3,277,657. This application Dec. 27, 1965, Ser. No. 516,505

Int. Cl. F25d *3/10*

U.S. Cl. 62—63 **14 Claims**

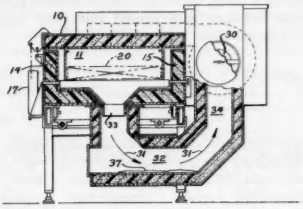


1. Apparatus for flash freezing of articles comprising housing means defining a substantially thermally isolated process chamber, means including a conveyor operating in said chamber for transporting articles in succession along a process path leading into, through and out of said chamber, means including spray nozzle mechanism mounted within said chamber for directing a spray discharge of liquid nitrogen against each article at a certain region along said process path to flash at least partially to gas for freshly generating gaseous nitrogen within said chamber, pumping means operable concurrently with the spray discharge means and having a suction inlet and a discharge outlet communicating with generally transversely spaced lengthwise distributed locations flanking another region along said process path to develop high velocity stream flow traveling a generally transverse recirculation flow path distributed lengthwise through said chamber to impinge upon each article moving thereby, said stream flow being comprised partly of recirculated gaseous nitrogen and partly of freshly generated gaseous nitrogen, and means for withdrawing gaseous nitrogen from the apparatus at a rate for maintaining atmospheric pressure substantially throughout the remainder of said chamber.

3,871,186
APPARATUS AND METHOD FOR REFRIGERATING ARTICLES

Richard C. Wagner, Darien, Ill., assignor to Integral Process Systems, Inc., Park Forest, Ill.

Filed Aug. 23, 1973, Ser. No. 390,755
Int. Cl. F25d 17/02
U.S. Cl. 62—64 14 Claims

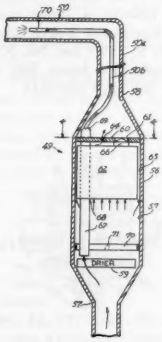


1. Apparatus for refrigerating articles, comprising: means defining an insulated chamber having an entrance and an exit for said articles; conveyor means for moving said articles in the chamber in a path from the entrance to the exit; liquid flow means for introducing a liquid cryogen into said chamber for contact with said articles at an introduction area spaced from said entrance with resulting generation of cryogen gas; means between said introduction area and entrance for recirculating cryogen gas from said chamber in a recirculation path including a path portion located externally of the chamber; and means for collecting any remaining liquid cryogen from said chamber in said external path portion for contact with the recirculated cryogen gas passing therethrough.

3,871,187
REFRIGERATION SYSTEM AND FLOW CONTROL DEVICE THEREFOR

John Skvarenina, 2639 W. Augusta, Chicago, Ill. 60622

Filed June 11, 1973, Ser. No. 369,055
Int. Cl. F25b 41/00
U.S. Cl. 62—196 12 Claims

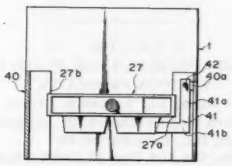


1. In a refrigerating apparatus of the type having a refrigerant capable of boiling under relatively low pressure to absorb heat and condensing under relatively high pressure to expel heat, the combination including: a compressor having a high pressure outlet port and a low pressure inlet port, a condenser having an inlet port in fluid communication with said high pressure outlet port of said compressor and further having a high pressure liquid refrigerant outlet port, an evaporator having an inlet port in fluid communication with said high pressure liquid refrigerant outlet port of said condenser and having an outlet port in fluid communication with said inlet port of said compressor, and a flow control device connected in the fluid line between the outlet port of said condenser and the inlet port of said evaporator, said fluid control device having first flow passage means for supplying a restricted fluid flow of refrigerant to said evaporator when said compressor is running and producing a high pressure at the outlet port thereof during a refrigerating cycle, said fluid control device further having second flow passage means independent of said first flow passage for supplying an unrestricted fluid flow of refrigerant to said evaporator when said compressor is stopped, said first flow passage means of said fluid control device includes a capillary tube having a terminating end extending into said evaporator whereat the high pressure liquid refrigerant is converted to low pressure gas refrigerant during the refrigerating cycle, said second flow passage means of said flow control device including a conduit connected between the outlet port of said condenser and the inlet port of said evaporator, said second flow passage means including fluid flow limiting means which directs the refrigerant within the system primarily through said capillary tube during the normal refrigerating cycle, and which directs the refrigerant within the system primarily through said conduit at the termination of said refrigeration cycle, whereby the inherent residual high pressure liquid at the outlet port of said condenser will flow substantially unrestricted into said evaporator to provide an automatic defrosting cycle and rapidly to provide a pressure balance within the refrigerating apparatus.

3,871,188
DEMOUNTABLE TRANSPORTATION REFRIGERATION UNIT

Ingebret Hadland Vold, Bloomington, and David Hutton Taylor, Minneapolis, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Sept. 7, 1973, Ser. No. 395,314
Int. Cl. F25d 19/00
U.S. Cl. 62—298 2 Claims



1. A transportable refrigeration unit to be removably secured to the exterior of an enclosed storage compartment to be refrigerated comprising, an evaporator coil, evaporator coil fan means, an evaporator compartment having a circulated air intake opening, an evaporator associated discharge duct, said discharge duct having dimensions which are less than that of the intake opening and arranged to extend within said air intake opening in relatively concentric relationship therewith and through an aperture of said storage compartment when

the refrigeration unit is removably attached thereto, a condenser, a compressor, a main frame, said main frame having means adapted to support said evaporator compartment and discharge duct, said condenser, and said compressor in a substantially vertical alignment with respect to one another and including a subframe removably secured to said main frame and adapted to support only said evaporator coil, evaporator fan means, evaporator compartment, and evaporator associated discharge duct, whereby circulated air passing through the evaporator coil may be circulated from the air intake opening through the evaporator coil and discharge duct and the subframe may be removed without disturbing the contents of the storage compartment or the main frame of the refrigeration unit should repair or replacement of the subframe components become necessary.

3,871,189

ICE MAKING DEVICE

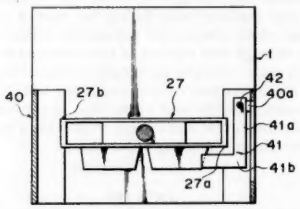
Toshiyuki Ohnishi, Osaka, Japan, assignor to Tokyo Shibaura Electric Co., Ltd.

Filed Oct. 1, 1973, Ser. No. 402,279

Claims priority, application Japan, Oct. 2, 1972, 47-114320

Int. Cl. F25c *1/10*

U.S. Cl. 62—353 **5 Claims**



1. An ice making device comprising a body, a driving mechanism provided within the body, a shaft rotatable in one direction by the driving mechanism, a flexible ice tray having one end mounted to the shaft and adapted to be rotatable within the body and an actuator provided at one side of the tray near to the other end of the tray, the actuator having a base section rotatably supported on the body and an engaging section which when the tray is rotated through the shaft in one direction is temporarily engaged with said one side of the tray to cause the rotation of the tray to be restricted at said one side of the tray to permit the tray to be twisted, and thereafter rotated to be disengaged from it by the rotational force of the tray.

3,871,190

METHOD AND APPARATUS FOR FLASH FREEZING VARIOUS PRODUCTS

John D. Harper, Elgin, Ill.; Frederick Breyer, Boca Raton, Fla., and Richard Wagner, Darien, Ill., assignors to Integral Process Systems, Inc., Park Forest, Ill.

Division of Ser. No. 516,505, Dec. 27, 1965, which is a division of Ser. No. 487,446, Sept. 15, 1965, Pat. No. 3,277,657. This application May 10, 1974, Ser. No. 468,816

Int. Cl. F25b *19/00*

U.S. Cl. 62—380 **1 Claim**

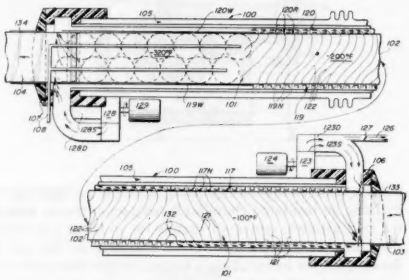
1. A cryogenic freezer for ultra-fast freezing of products with a cryogenic liquid comprising:

a. insulated wall means forming an elongated, horizontally extending tunnel having an inlet and an outlet;

b. conveyor means having at least one reach extending through the interior of said tunnel for conveying a product to be frozen through said tunnel from said inlet to said outlet;

c. means forming a liquid-product contact zone in said tunnel, said means including conduit means for introducing a cryogenic liquid refrigerant into said tunnel in contact with said product on said conveyor for freezing said product and vaporizing said liquid to form a refrigerant gas;

d. passage means forming a plurality of distinct, substantially closed, recirculation paths for independently recirculating said refigerant gas in each of said paths, said recirculation paths being adjacent each other in series along the length of said conveyor for successively contacting the product on the conveyor with the gas recirculating in each path, all of said recirculation paths being positioned between said tunnel inlet and said liquid-product contact zone;



e. passage means for conducting newly generated refrigerant gas from said liquid-product contact zone into the recirculation path adjacent thereto;

f. passage means for conducting portions of the refrigerant gas from each recirculation path to the next recirculation path closer to said tunnel inlet such that the average temperature of the gas in each path increases in the direction of the tunnel inlet;

g. passage means for exhausting a portion of the refrigerant gas from the recirculation path closest to said tunnel inlet; and

h. gas flow producing means for recirculating the refrigerant gas in each of said recirculation paths at a velocity sufficient to produce turbulent flow of the refrigerant gas in contact with the product.

3,871,191

GEARED TYPE SHAFT COUPLING

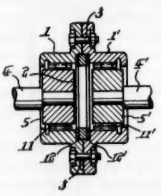
Kuniyoshi Sugimoto, Yokohama, Japan, assignor to Kabushiki Kaisha Hasegawa Haguruma, Tokyo, Japan

Filed July 5, 1973, Ser. No. 376,440

Claims priority, application Japan, July 7, 1972, 47-79671

Int. Cl. F16d *3/18*

U.S. Cl. 64—9 R **3 Claims**



1. A geared type shaft coupling comprising two interior hubs secured to respective shafts and each having external gear teeth, a sleeve transversely split into two sections of identical configuration having internal gear teeth for meshing engagement with said respective interior hubs, means for securing said two sleeve sections together in axially abutting relation to each other, said sleeve sections being counterbored

at the abutting ends thereof to the same axial depth and diameter jointly to define an annular groove of rectangular cross section around the inner periphery of said sleeve midway of its axial length, and a ring member closely fitted in said annular groove and comprised of a flat annular disc of hard material having an external diameter substantially equal to the diameter of said annular groove, and a pair of annular flat gaskets bonded to the opposite sides of said annular disc, each of said gaskets made of an elastic material, each said gasket having an inner and an outer diameter substantially equal to the inner and outer diameter of the discs, said ring member having a total thickness slightly larger than twice the axial depth of the counterbore in each of said sleeve sections, and said annular gaskets are each beveled on its outer edge.

3,871,192

FORKED UNIVERSAL JOINT MEMBER

Heinrich Muhr, Duesseldorf; Wolfgang Sprenger, Mettmann; Franz-Dieter Schnitzler, Dusseldorf-Oberkassel; Adolf Degenkolbe, Meerbusch; Hans Willemsen, Neuss-Reuschenberg; Horst Bruss, Solingen; Willy Blumberg, Dusseldorf-Oberkassel, and Manfred Belsdorf, Meerbusch; all of Germany, assignors to A. Ehrenreich & Cie., Dusseldorf, Germany

Filed Nov. 7, 1973, Ser. No. 413,446

Claims priority, application Germany, Nov. 18, 1972, 2256726

Int. Cl. F16d *3/26*

U.S. Cl. 64—17 R **2 Claims**

1. A forked member, for use in a universal joint and permitting detachable connection to a shaft,

comprising, in combination,

a deformed pipe, having first and second end portions and defining near said first end portion a forked part including prongs adapted to be engaged in a universal joint; .

said pipe further defining near said second end portion a clamp-like member adapted to clamp detachably the shaft in proper alignment with said forked part while resisting deformation thereof, said clamp-like member comprising:

a longitudinal fold extending from said second end toward said first end;

said pipe further defining a longitudinal slot extending from said second end toward said first end and being open at said second end; and

said ovally deformed pipe further defining a multiplicity of bore holes adapted to permit an attachment element in transversal direction to said slot.

3,871,193

SPRING LOAD SYSTEM FOR DRILL STRING SHOCK ABSORBERS

James Whitehurst Young, Irving, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 12, 1973, Ser. No. 423,964

Int. Cl. E21b *17/04*

U.S. Cl. 64—23 **10 Claims**

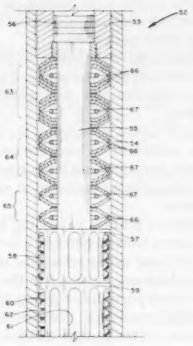
1. A shock absorbing torque transmitting well tool, comprising:

an outer member;

an inner member, said outer member and said inner member being telescopically arranged;

spline means between said outer member and said inner member for transmitting torque; and

spring means connected to said outer member and connected to said inner member, said spring means including a first spring unit with a first spring constant and a second



spring unit with a second and different spring constant said first spring unit and said second spring unit including a multiplicity of disc springs positioned between said inner and outer members.

3,871,194

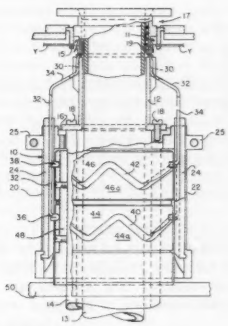
CIRCULAR KNITTING MACHINE

John Greczin, 7312 School Ln., Melrose Park, Pa. 19126, and Roy D. Faigenbaum, deceased, late of 4072 Mountain Rd., Melrose Park, Pa. (by Sylvia Faigenbaum, executrix)

Filed Dec. 27, 1972, Ser. No. 316,878

Int. Cl. D04b *9/44, 15/14*

U.S. Cl. 66—9 A **4 Claims**



1. In a circular knitting machine having at least one yarn feed and including a needle cylinder, a pair of spaced lower slots in said cylinder, a pair of first and second latch needles individually disposed each in one of said lower slots, each of said needles being lengthwise movable in its slot to and between its latch-clearing and cast-off positions, the combination of

A. actuating means for moving the pair of needles in unison between their latch-clearing and cast-off positions,

i. said actuating means including a pair of cams,

ii. one said cam actuating said first latch needle and the other said cam actuating the second latch needle,

B. a needle stem positioned above the needle cylinder and terminating upwardly in an upper edge portion,

i. said needle stem including a pair of spaced upper slots,
ii. each said upper slot being in vertical alignment above one said lower slot,
iii. each said upper slot being defined from a base and having sidewalls extending outwardly from the base,
a. the said needle stem having an outer periphery and the slot sidewalls extending outwardly from the base to the outer periphery,

C. spacer means separating the said spaced slots to knit said yarn feed into stitches, the width of which is a function of the course-wise distance between the first and second latch needles,
i. said spacer means separating the pair of upper slots a distance sufficient to accommodate the width of at least three conventional latch needles, and

D. an undercut portion fabricated in said needle stem at its upper portion,
i. said undercut portion extending laterally between the pair of upper slots to provide a forecut common to the pair of slots and within which the stitches formed by the needles which are disposed in the slots may extend,
ii. said undercut portion extending downwardly within the upper edge portion a distance at least sufficient to correspond to the length of travel of the needles between their latch clearing and cast-off positions and within which the stitches formed by the needles which are disposed in the upper slots may extend.

3,871,195

APPARATUS FOR USE IN DYEING TEXTILE MATERIALS

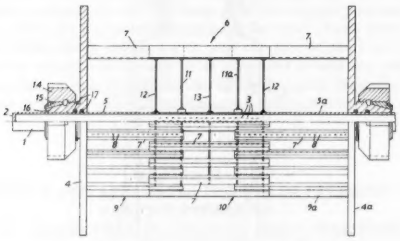
James Donald MacKay Gibson, Ilkley, England, assignor to I.W.S. Nominee Company Limited, London, England

Filed Apr. 18, 1973, Ser. No. 352,444

Claims priority, application United Kingdom, Apr. 18, 1972, 17922/72

Int. Cl. B65h *75/20;* **B05c** *8/02*

U.S. Cl. 68—198 **4 Claims**



1. A dye beam of adjustable width comprising:
a hollow shaft formed with perforations in its centre portion to permit the passage of treatment liquor therethrough;
two end plates mounted in spaced relationship on said shaft, at least one of said end plates being movable along said shaft; and
a telescopic framework mounted in parallel spaced relation to the said shaft and cooperating with the end plates for supporting a textile fabric, the width of the framework being adjustable by movement of the at least one of said end plates, wherein the framework comprises a plurality of elements of generally U-shaped section extending parallel to the axis of the hollow shaft and supported thereon, the U-section elements being disposed in at least two groups displaced from one another in the said axial direction, the elements of each group being substantially uniformly spaced around the hollow shaft and having the open end of their U-section facing radially outwards.

3,871,196

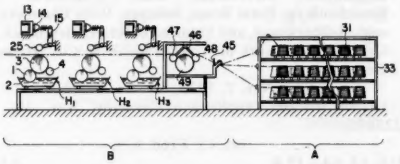
APPARATUS FOR CONTINUOUSLY PRINTING YARNS WITH SPLASHED PATTERN OF RANDOM PITCHES

Hirotsugu Matsunaga, Kyoto, Japan, assignor to Hanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 213,006, Dec. 28, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,529

Int. Cl. B05c *1/08*

U.S. Cl. 68—203 **5 Claims**

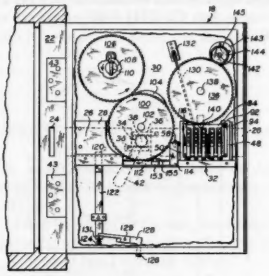


2. An apparatus for continuously printing yarns with splashed pattern of random pitches, comprising:
yarn running means causing the yarns to run in their longitudinal direction at a given speed;
a plurality of yarn printing means provided at different positions along the running yarns, each printing means including a dye carrying surface for holding dye thereon and being positioned adjacent to and a little apart from said running yarns, each printing means also including a yarn pressing member opposing the respective dye carrying surface to keep the running yarns between said dye carrying surface and said yarn pressing member and being actuated toward and away from the respective dye carrying surface in response to a control signal applied thereto; and
a corresponding plurality of pattern signal generating means respectively associated with respective ones of said yarn printing means, each of said pattern signal generating means including a rotary drum rotating at a speed different from that of the rotary drum included in each other pattern signal generating means, each drum having a plurality of spaced projecting ridges formed circumferentially thereof and defining a given pattern program, each pattern signal generating means also including switch means actuated by being contacted by the projecting ridges of the respective drum for delivering said control signal to be applied to the corresponding yarn pressing member;
shaft means for supporting the drums associated with said plurality of pattern signal generating means in axial alignment with one another for permitting each drum to rotate at a speed different from that of the rotary drum associated with each other pattern signal generating means;
drive means for rotating each drum at a speed which is different from the rotation speed of the other drums, said drive means including a plurality of driving mechanism each associated with one of said drums; and
control means associated with said switch means for permitting delivery of only a single control signal even though more than one of said switch means are simultaneously actuated, whereby said control means prevents overlap in the printing of the yarns.

3,871,197
COMBINATION SAFE

Martin A. Waxgiser, 125-10 Queens Blvd., Kew Gardens, N.Y. 11415, and Leonard Foreman, 2407 Joel Dr., North Bellmore, N)Y) 11710

Filed Feb. 5, 1974, Ser. No. 439,960
Int. Cl. E05b *37/02*
U.S. Cl. 70—63 **33 Claims**



1. In combination with a closeable door; a door frame for receiving said door; movable latch means including complementary parts on said door and door frames for latching said door in the position in which it is received by said door frame; and means for locking said latching means in latching position comprising said door; a combination lock of the type having a plurality of side-by-side coding wheels, a rotatable cam associated with each coding wheel, means for releasably engaging each of said coding wheels with its associated cam for concomitant rotation, cam follower means operatively engageable with said latching means for preventing movement thereof out of its latching position, said cam follower means being movable by each of said cams to and from said latch movement preventing position and from and to a second position out of operative engagement with said latching means, whereby all of said cams must be in predetermined positions to move said cam follower means out of said latch movement preventing position; the improvement comprising:

a key lock including a key receiving member movable between a key receiving position, a second position and a position intermediate said other two positions;

means for actuating said means for releasably engaging said cams with said coding wheels to release said cams from said coding wheels when said key receiving means is in said intermediate position, said last mentioned actuating means being ineffective when said key receiving member is in said key receiving position and in said second position; and

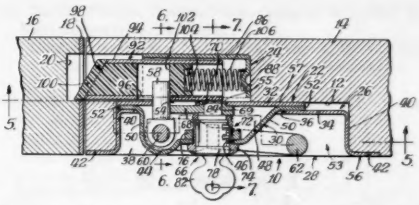
means for preventing said key receiving member from being moved to said key receiving position unless said coding wheels are each in a preselected position.

3,871,198
DOOR LOCK MEANS

Kenneth J. Miller, Gurnee, Ill., assignor to A. L. Hansen Mfg. Co., Gurnee, Ill.

Filed Nov. 9, 1973, Ser. No. 414,228
Int. Cl. E05b *5/00*
U.S. Cl. 70—146 **6 Claims**

1. A lock bolt operating handle assembly comprising a pan-shaped housing unit presenting front and back face portions in spaced-apart planes and a closed exposed front surface, a lock bolt engaging and operating member located rearwardly of said exposed front surface and projecting through the plane of said back face portion, arm means pivotally mounting said operating member in said housing unit on an axis intermediate of the planes of said front and back face portions and projecting through said exposed front surface, and a handle normally lying intermediate of the planes of said front and back face portions and secured to said arm means

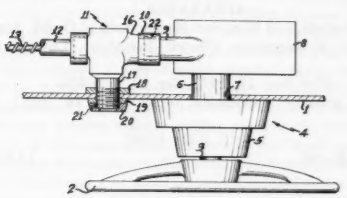


forwardly of said exposed front surface for effecting pivotal movement of said arm means and said operating member.

3,871,199
BOAT LOCK

Karl Lennart Perldal, Torslanda, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

Filed Feb. 7, 1974, Ser. No. 440,324
Int. Cl. B60r *25/02*
U.S. Cl. 70—252 **10 Claims**



1. An anti-theft lock for boats having wheel steering, in which the steering wheel movement is transmitted to a rudder by means of a steering cable formed with a cogged surface driven by a cogwheel which is coupled to the steering wheel, said lock comprising a housing through which the steering cable moveably extends, a locking bolt in said housing which is moveable therein towards and away from said steering cable, said locking bolt including a portion provided with teeth moveable with said locking bolt into and out of meshing engagement with the cogs of said cable, means for moving said locking bolt, and means operative to lock the locking bolt in cable locking position with said teeth engaged with the cogs of the steering cable.

3,871,200
METHOD AND APPARATUS FOR PRODUCING SINTERED METAL PRODUCT

Mineo Onoda, Takarazuka, and Takahiko Kimura, Nagoya, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed July 2, 1973, Ser. No. 376,061
Claims priority, application Japan, Feb. 6, 1973, 48-14964
Int. Cl. B21c *23/32;* **B22f** *3/24*
U.S. Cl. 72—41 **3 Claims**

1. In a method for producing a sintered metal product, including the steps of:

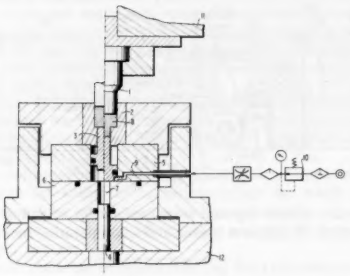
lubricant cooling the surface of a sintered metal pre-form billet of low to medium density, and

extruding said billet under pressure through a die in one direction while maintaining it at a temperature ranging from room temperature to 750°C.,

the improvement comprising:

the step of simultaneously applying a back pressure to said billet during extrusion in a direction opposite to that of extrusion with said back pressure being at least

twenty per cent of extrusion pressure;



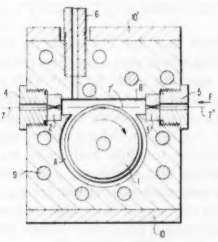
whereby, the sintered metal product thus obtained has a higher, more uniform density and is free from surface and inner crack with its inner pores not enlarged.

3,871,201

CONTINUOUS HYDROSTATIC EXTRUSION-DRAWING APPARATUS

Makoto Hayashi, and Masanori Hinata, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 17, 1973, Ser. No. 425,650
Claims priority, application Japan, Dec. 16, 1972, 47-126590
Int. Cl. B21c *33/00*
U.S. Cl. 72—60 **3 Claims**



1. A continuous hydrostatic extrusion-drawing apparatus comprising:

a main body housing defining therein a wire passage, in which a working fluid under pressure is confined and through which a wire to be extruded and drawn is made to pass;

a first die disposed at the inlet of said wire passage and formed with a bore having an effective diameter which is smaller than that of a fed wire;

a second die disposed at the outlet of said wire passage and formed with a bore having an effective diameter which is smaller than that of the first-named die;

pulling means disposed within said working fluid midway of said wire passage and directly frictionally gripping said wire for continuously pulling the fed wire through the first-named die to such an extent as to overcome the back tension which is exerted on the passing wire due to the difference in the effective diameter between the first- and second-named dies; and

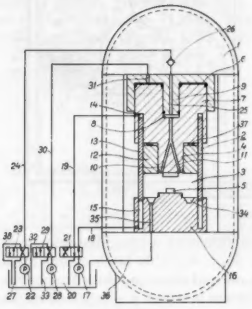
take-up means disposed outside of said main body housing for continuously pulling the once-pulled wire through the second-named die in synchronism with said pulling means and acting to such an extent as to afford a predetermined front tension to said once-pulled wire and for concurrently taking up the twice-pulled wire thereon.

3,871,202

FORGING PRESS

Harry Claesson, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Apr. 22, 1974, Ser. No. 463,039
Claims priority, application Sweden, May 3, 1973, 7306177
Int. Cl. B21j *9/02*
U.S. Cl. 72—60 **9 Claims**



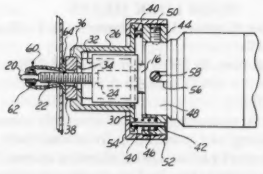
1. Forging press comprising a forging chamber (**3**), a forging piston (**4**) sealingly insertable into the forging chamber (**3**) for forging billets (**5**) arranged in the forging chamber (**3**), a main cylinder (**6**) and a main piston (**7**) arranged in the main cylinder (**6**) for imparting movement to said forging piston (**4**), means for filling said forging chamber (**3**) with oil which is compressed when the forging piston (**4**) forces its way into the forging chamber (**3**), a pressure-equalizing chamber (**8**), means connecting the forging chamber (**3**) with the pressure-equalizing chamber (**8**), a back-pressure piston (**9**) with a smaller piston area than the forging piston (**4**) sealingly insertable into the pressure-equalizing chamber (**8**) and the main piston (**7**) being operatively connected to the forging piston (**4**) to effect a change in the volume of the forging chamber (**3**) and the pressure-equalizing chamber (**8**), respectively, the volume of the pressure-equalizing chamber (**8**) thereby increasing when that of the forging chamber (**3**) decreases.

3,871,203

TUBULAR FASTENER SETTING POWER TOOL

Martin Wellin, Oak Park, Mich., assignor to U.S. Industrial Tool & Supply Co., Detroit, Mich.

Filed Mar. 25, 1974, Ser. No. 454,080
Int. Cl. B21j *15/34*
U.S. Cl. 72—114 **5 Claims**



5. An attachment for a manually supported tool having a reversible rotatable spindle to adapt the tool for setting tubular fasteners having a flange at one end and an internally threaded section at the other end which is collapsible toward

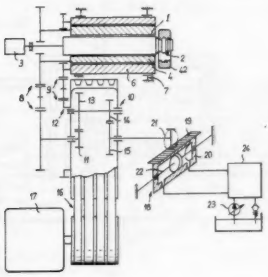
the flange to set the fastener, comprising: an elongated bit having one end adapted to be supported in the spindle of the tool, having a pilot section with cross-sectional dimensions allowing it to pass through the internal thread on the fastener on the other end, and having a threaded section adapted to engage the internal thread on the fastener formed adjacent to the pilot section: an annular pressure ring for engaging and supporting the flange of the fastener: means for supporting said ring on the nonrotary section of the tool so that it surrounds the bit and is slidable axially with respect to the bit; and means for biasing said pressure ring toward its axial position wherein it is displaced from the stationary section of the tool.

3,871,204

MACHINES FOR MANUFACTURING BEARING RACES BY ROLLING

Jean Gerat, and Georges Gerbet, both of Annecy, France, assignors to Societe Nouvelle de Roulements, Annecy (Haute Savoie), France

Filed July 13, 1973, Ser. No. 378,815
Claims priority, application France, Aug. 9, 1972, 72.28788
Int. Cl. B21d *17/04*
U.S. Cl. 72—117 **15 Claims**



1. In a machine for rolling annular workpieces in an external die with a rolling tool roller operating in overhanging relationship in a blank of the workpiece to be rolled, said machine comprising:

a frame structure,

first and second sleeves, said first sleeve being disposed eccentrically in said second sleeve,

a spindle fitted eccentrically in said first sleeve,

said tool roller being rigidly connected to one end of said spindle,

said second sleeve being rotatably mounted in said frame structure,

drive means for rotating said sleeves at the same speed,

means for angularly displacing said sleeves relative to each other for controlling the feed movement of the tool roller, a motor for rotatably driving said spindle and said tool roller at such speed that the relative speed of the tool roller at a peripheral point thereof approaching a blank to be rolled is substantially zero,

said drive means comprising an epicyclic gear train operatively connected through two rotating members of said gear train to said sleeves, said rotating members being coactable with a third member of said gear train,

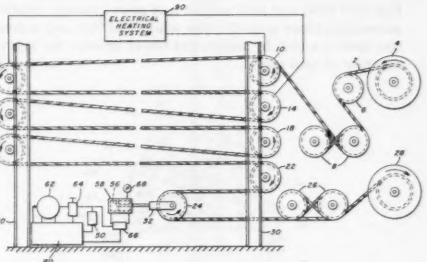
said third member being responsive to said angularly displacing means and constituting a reaction member, the angular setting of which is controlled by said angularly displacing means as a function of the desired rate of feed movement of the tool roller.

3,871,205

APPARATUS FOR LENGTH STABILIZATION OF A CABLE

G. Donald Fenton, Paxton, Mass., assignor to United States Steel Corporation, Pittsburg, Pa.

Continuation of Ser. No. 168,935, Aug. 4, 1971,. This application May 21, 1973, Ser. No. 362,611
Int. Cl. B21f *9/00*
U.S. Cl. 72—128 **6 Claims**



1. In an apparatus for length stabilizing a length of cable which apparatus comprises a pair of hold-back sheaves for providing a braking effect, a pair of pulling sheaves, means for driving said pulling sheaves, a series of intermediate sheaves between said hold-back sheaves and said pulling sheaves, said sheaves defining a path through which a cable may travel through the apparatus and one of said intermediate sheaves being mounted for applying tension to the cable between the hold-back sheaves and the pulling sheaves, the combination therewith of means connected to said hold-back sheaves for alternately increasing and decreasing the braking effect of said hold-back sheaves between a maximum level and a minimum level in timed cycles and means connected to one of said intermediate sheaves for applying tension and responsive to said change in braking effect for tensioning said cable between maximum and minimum levels whereby each increment of cable length is tensioned through a multiplicity of cycles.

3,871,206

CONTINUOUS ROTARY PRESS

Ichizo Otoda, Hyogo; Akio Nakamura, Kyoto; Takashi Kanehisa, Kyoto; Yasuo Taki, Kyoto; Makoto Yokozeki, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 29, 1973, Ser. No. 392,465
Claims priority, application Japan, Aug. 29, 1973, 48-86926; Aug. 4, 1973, 48-87828; Aug. 16, 1973, 48-921181; Aug. 16, 1973, 48-921182; Aug. 16, 1973, 48-921183; Aug. 16, 1973, 48-921184; Aug. 16, 1973, 48-921186; Aug. 16, 1973, 48-921187
Int. Cl. B21d *22/08*
U.S. Cl. 72—190 **24 Claims**

1. A continuous rotary press which comprises in combination:

a rotary turret;

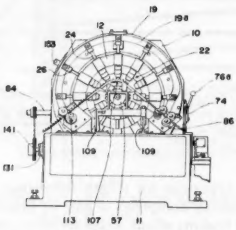
a plurality of first tool units radially arranged with respect to the axis of rotation of said turret and slidably supported by said turret;

second tool units corresponding in number to said first tool units, each mounted in cooperative relation with the corresponding one of said first tool units for performing a definite press work, said second tool units being radially arranged with respect to the axis of rotation of said turret in alignment with said respective first tool units and slidably supported by said turret around and adjacent to the axis of rotation of said turret;

means operatively positioned for rotating said rotary turret in one direction while carrying said first and second tool units;

first means stationarily held by a non-movable portion of the machine body for successively causing said first tool units to alternately move close to and away from the corresponding second tool units during each rotation of said turret;

second means stationarily held by a non-movable portion of the machine body for successively causing said second tool units to alternately move close to and away from the corresponding first tool units during each rotation of said turret, said definite press work being performed as said first tool units and said second tool units undergo relative movement close to each other while said first and second tool units carried by said turret travel around the axis of rotation of said turret;



means operatively positioned for guiding a strip material, which is to be subjected to said definite press work, so as to feed said strip material between said first and second tool units, said strip material being successively held in position between said first and second tool units during the performance of said definite press work with no substantial interruption in the advance thereof; and

stripper means stationarily carried around the axis of rotation of said turret for rotation together therewith, said stripper means having a flat surface, the plane of said flat surface intersecting the direction of movement of any of the corresponding first and second tool units of one pair, said strip material being adapted to be wound around said stripper means so as to be fed therearound substantially without accompanying lengthwise and widthwise displacements.

3,871,207

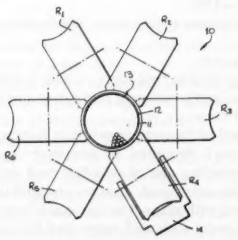
APPARATUS FOR PRODUCING CORRUGATIONS ON SCREENS OF FULLY-FILLED CABLES

Antonio Ferrentino, Monza, Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed May 1, 1974, Ser. No. 465,828

Int. Cl. B21d *15/06*

U.S. Cl. 72—194 **14 Claims**



1. In apparatus for producing circumferential sealing corrugations on the screen of a fully-filled cylindrical cable having a core with said screen therearound, a plurality of rotatable, similar rollers, even in number and at least six in number, means supporting said rollers side-by-side and as a crown around a circle having a diameter equal to the maximum diameter of the screen to be corrugated and with the planes of rotation thereof perpendicular to the plane of said circle, each of said rollers having radially extending side faces with a peripheral groove therebetween and having at least one ridge extending transversely of said groove and from one said side face to the other, said ridge having an arcuate, concave, radially outward face which is radially outward of said groove, said rollers being mounted with each ridge of one roller overlapping at its end portions the end portions of the ridges on rollers at opposite sides of said one roller, whereby ridges of alternate rollers lie substantially in a plane substantially parallel to said plane of said circle, and means interconnecting said rollers for restricting said rollers to rotation in synchronism with each other.

3,871,208

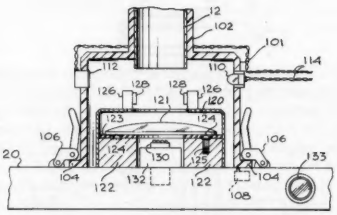
VALIDATED DROP TEST APPARATUS

Joseph E. Berg, Los Angeles, Calif., assignor to Precision Thin Film Corporation, Los Angeles, Calif.

Filed Feb. 20, 1973, Ser. No. 333,756

Int. Cl. G01n *3/30*

U.S. Cl. 73—12 **9 Claims**



1. Drop test apparatus for validating optical lenses comprising:

a. a light-shielded channel;

b. a drop ball for testing a particularly positioned optical lens by impact thereon;

c. drop ball release means releasably holding the drop ball in light-sealing engagement in said channel above the lower end thereof;

d. a drop ball detector positioned at a point adjacent the channel below the release means for detecting the passage of the drop ball past said point; and

e. solenoid activated indicia marking means responsive to a signal from the drop ball detector for marking a successfully tested lens and imprinting corresponding indicia on an associated record form identifying said lens.

3,871,209

METHOD OF EXTERNALLY TESTING CONNECTIONS BETWEEN TUBULAR MEMBERS

Malvern M. Hasha, 111 Acacia St., Lafayette, La.

Filed Mar. 25, 1971, Ser. No. 127,949

Int. Cl. G01m *3/28*

U.S. Cl. 73—49.1 **23 Claims**

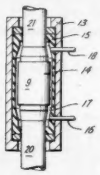
1. A method of testing a substantially full made up connection between tubular members comprising the steps of:

a. surrounding the connection externally to seal it off;

b. applying an external pressure to the surrounded connection within the range of approximately 60 percent to approximately 90 percent of the collapse pressure rating

of the tubular bodies; and

c. while maintaining such pressure, determining any pressure decay as an indication of the integrity of the connection between the tubular bodies.



3,871,210

VIBRATION TESTING APPARATUS WITH PRELOAD CONTROL

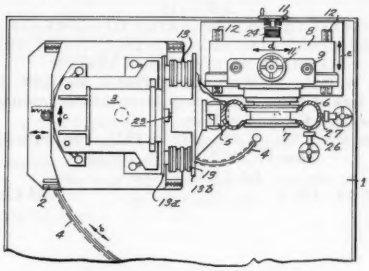
Gunther Himmler, Darmstadt; Klaus-Peter Ohms, Da-Eberstadt, and Peter-Max Gruber, Pfungstadt, all of Germany, assignors to Gebr. Hofmann KG, Darmstadt, Germany

Filed Nov. 3, 1972, Ser. No. 303,390

Claims priority, application Germany, Nov. 12, 1971, 2156369

Int. Cl. G01h *1/00*

U.S. Cl. 73—67 **7 Claims**



1. In an apparatus for carrying out structural tests of rotors having an oscillator having a coordinated exciter head, a preload control means for setting a preload force, and means for detecting the response of a rotor to said oscillation of the body to be tested under the action of the oscillator and the preload force including at least one vibration pick-up, the improvement comprising means for mounting said oscillator in regard of its direction of oscillation for pivotal movement over a certain angular range of 90° particularly, in relation to the body under test, and means for applying the exciting force by said oscillator independently of and separately from the force applied by said preload control means and means for swivelling said preload control means together with the oscillator and said coordinated exciter head for exciting the rotor.

3,871,211

TENSIOMETER

Aharon Tal, 131 Hanassi St., Herzliya, Israel

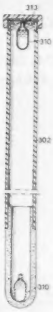
Filed Sept. 21, 1973, Ser. No. 399,509

Claims priority, application Israel, Apr. 27, 1973, 42132

Int. Cl. G01n *7/10*

U.S. Cl. 73—73 **2 Claims**

1. A tensiometer for measuring soil-moisture tension, comprising: a tensiometer tube hermetically sealed at the top and closed at the bottom by a water-permeable member and adapted to be completely filled with water which is permeable through said member into and out of the ground in accordance with the soil-moisture tension of the ground in which it is inserted; and an indicating device disposed within the tensiometer tube and including a member defining an expansible chamber containing a liquid and a captive gas-bubble therein; said expansible-chamber-defining member being freely movable in the tensiometer tube from a position at the top of the tube indicating the soil is dry and should be watered, to a lower position indicating the soil is sufficiently moist and no watering is necessary; the top of the tensiometer tube being transparent to permit viewing the position of the indicating device.



3,871,212

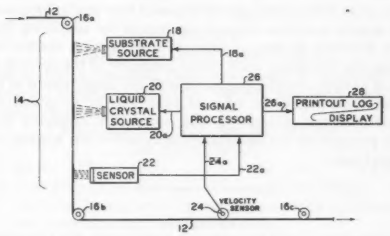
SYSTEM AND METHOD FOR MONITORING QUALITY CHARACTERISTICS OF A MOVING WEB

Ernest J. Neugroschl, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 4, 1973, Ser. No. 357,291

Int. Cl. G01b *11/16*

U.S. Cl. 73—88 A **14 Claims**



1. A system for monitoring the quality characteristics of a moving web comprising:

A. a source of liquid crystals compounded to reflect radiant energy in response to stress;

B. means to apply the liquid crystals to the surface of the web;

C. sensor means responsive to the reflected radiant energy from the liquid crystals on the web to provide signals indicative of the stress in the web as exhibited by the wavelength of the reflected energy;

D. a velocity sensor positioned relative to the web to provide an output signal indicative of the web speed; and

E. a signal processor operatively connected to the velocity sensor, the means applying the liquid crystals, and the sensor means, to provide control signals in response to the web velocity such that the liquid crystals may be selectively applied at intervals along the length of the web

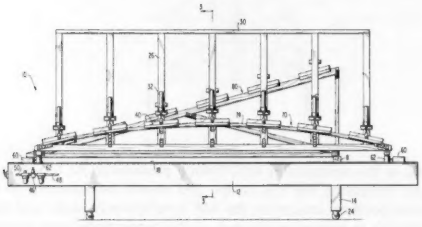
and to receive the output of the sensor means to provide signals indicative of the web stress profile.

3,871,213

TEST STAND FOR TRUSSES

John Calvin Jureit, 8901 Arvida Ln., Coral Gables, Fla. 33156; Adolfo Castillo, 7761 S.W. 18th Ter., Miami, Fla. 33155, and Carlos Rionda, 11120 S.W. 50th Ter., Miami, Fla. 33165

Filed Jan. 7, 1974, Ser. No. 431,068
Int. Cl. G01n *3/08*
U.S. Cl. 73—94 **9 Claims**



1. A test stand for a truss comprising: an elongated, generally horizontally extending base, means carried by said base for supporting first and second generally vertically disposed trusses, a plurality of fluid actuated cylinders carried by said test stand including first and second sets thereof generally overlying said base at longitudinally spaced positions therealong, each said set thereof lying in a generally vertical plane extending parallel to said base with said sets lying adjacent opposite sides of said test stand, each of the cylinders of said first set thereof having a head engageable with the upper chord of the first truss supported by said base and at longitudinally spaced positions therealong, means for supplying fluid under pressure to the cylinders of said first set thereof for loading the first truss, each of the cylinders of the second set thereof having a head engageable with the upper chord of the second truss supported by said base and at longitudinally spaced positions therealong, and means for supplying fluid under pressure to the second set of cylinders for loading the second truss.

3,871,214

ELECTRONIC ENGINE INTAKE AIR FLOW MEASURING DEVICE

Kenji Masaki, and Shuya Nambu, both of Yokohama, Japan assignors to Nissan Motor Company, Limited, Yokohama, Japan

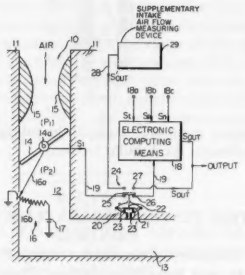
Filed Oct. 5, 1973, Ser. No. 405,623
Claims priority, application Japan, Oct. 6, 1972, 47-100495
Int. Cl. G01m *15/00*
U.S. Cl. 73—116 **4 Claims**

1. An intake air flow measuring device for an engine having an air intake system with a throttle valve, comprising;

a throttle opening sensor operative to produce an electrical throttle opening signal analogous to the degree of opening of the throttle valve;

electronic computing means responsive to said throttle opening signal and operative to produce an electrical flow rate signal analogous to the intake air flow rate corresponding to the degree of throttle opening; and

switching means responsive to the pressure at a point downstream of the throttle valve, and operative to connect said throttle opening sensor to said electronic computing



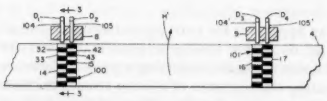
means when the ratio of said pressure to atmospheric pressure is below a predetermined value.

3,871,215

OPTO-ELECTRONIC APPARATUS TO GENERATE A PULSE-MODULATED SIGNAL INDICATIVE OF THE MECHANICAL STATE OF A SYSTEM

George W. Pratt, Jr., Wayland, and Paul G. McMullin, Malden, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 141,486, May 10, 1971,. This application June 19, 1972, Ser. No. 264,121
Int. Cl. G01l *3/08*
U.S. Cl. 73—136 A **45 Claims**

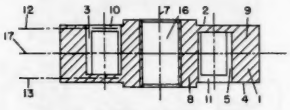


9. Apparatus for measuring torque transmitted by a rotating shaft, that comprises: a pair of axially spaced regions along the shaft at which are located elements carrying two contiguous areas of different optical characteristics having a sharply defined boundary therebetween, optical means at each region for detecting the passage of at least one said boundary at each region and generating primary electric signals which bear a fixed relation in time to the passage of the boundary, electrical circuit means for processing the primary electric signals from the optical means in a way that produces electrical pulses of fixed amplitude but of width determined by the time interval between the passage of a boundary at one region past the optical means at that region and passage of a boundary at the other region past the optical means at said other region, said optical means comprising a solid-state radiation detector whose effective light sensitive zone is small in cross dimension in the direction of travel of said areas therepast and whose light-to-electrical-energy time constants are fast compared to the time of passage of the areas past the detector.

3,871,216
DYNAMOMETER APPARATUS

Heinz Eder, Krefeld, Germany, assignor to Hottinger Baldwin Messtechnik GmbH, Darmstadt, Germany

Filed June 23, 1972, Ser. No. 265,620
Claims priority, application Germany, June 28, 1971, 2132012
Int. Cl. G01l 1/22
U.S. Cl. 73—141 A 9 Claims

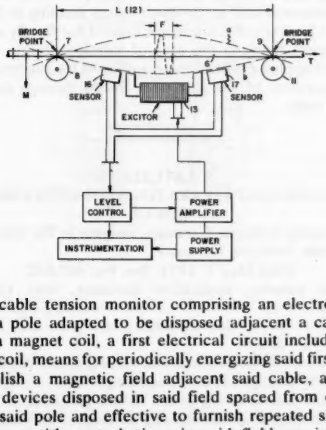


1. A dynamometer apparatus of the load cell type comprising a substantially cylindrical plate forming an elastic deformation body having a central axis, said plate having a first outer surface and a second outer surface, a central hub in said plate and a circumferential rim in said plate, a plurality of first blind holes extending from said first outer surface into said plate, said first blind holes being spaced from each other between said hub and rim, said first blind holes forming first ribs extending substantially radially and connecting said hub to said rim adjacent to said first outer surface, a plurality of second blind holes extending from said second outer surface into said plate but staggered relative to said first blind holes, said second blind holes also being spaced from each other between said hub and rim to form further ribs extending substantially radially and connecting said hub to said rim adjacent to said second outer surface, and strain sensing means secured to selected ones of said ribs.

3,871,217
CONTINUOUS CABLE TENSION MONITOR

David C. Miley, Los Altos, Calif., assignor to The Rucker Company, Oakland, Calif.

Filed Apr. 25, 1973, Ser. No. 354,390
Int. Cl. G01l 5/10
U.S. Cl. 73—143 11 Claims

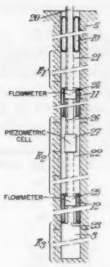


1. A cable tension monitor comprising an electromagnet having a pole adapted to be disposed adjacent a cable and having a magnet coil, a first electrical circuit including said magnet coil, means for periodically energizing said first circuit to establish a magnetic field adjacent said cable, a pair of pick-up devices disposed in said field spaced from opposite ends of said pole and effective to furnish repeated signals in accordance with perturbations in said field, an indicating device, means including a second electrical circuit and responsive to said repeated signals from said pick-up devices for controlling the frequency of energizing said first circuit, and means in said second electrical circuit for actuating said indicating device.

3,871,218
METHOD AND APPARATUS FOR DETERMINING THE PERMEABILITY CHARACTERISTICS OF A POROUS OR FISSURED MEDIUM

Claude Camille Louis, Saint Cyr en Val, France, assignor to Agence Nationale de Valorisation de la Recherche (Anvar), Paris, France

Filed Aug. 25, 1972, Ser. No. 283,634
Int. Cl. E21b 47/10
U.S. Cl. 73—155 7 Claims



1. Method for determining the permeability characteristics of a porous or fissured medium, comprising forming a borehole in situ in the medium, dividing said borehole along its axis into three adjacent cavities, separated from one another and comprising two protecting end cavities enclosing an intermediate measuring cavity, producing a flow of a liquid in each of the cavities and in the corresponding regions of corresponding medium, the direction of flow with respect to the medium being the same for each cavity, and effecting measurement of the flow-rate of liquid flowing in the intermediate cavity and measurements of the liquid pressure in said intermediate cavity and in the corresponding region of the medium, at known distances from the axis of the borehole and determining the permeability characteristics from said flow-rate and said liquid pressure measurements.

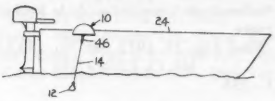
3,871,219
TROLLING SPEED INDICATOR

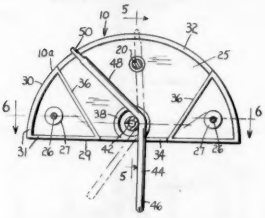
Jerry L. Quick, Ogallala, Nebr., and James D. Maxwell, Vancouver, Wash., assignors to Maxwell Manufacturing Co., Vancouver, Wash.

Filed Aug. 13, 1973, Ser. No. 387,767
Int. Cl. G01p 5/02
U.S. Cl. 73—184 2 Claims

1. A trolling speed indicator for a boat comprising
a. a housing having an interior portion defined by side walls, end walls, and top and bottom walls,
b. said top wall being rounded,
c. means on said housing arranged to support it over the edge of a boat,
d. means defining a longitudinal slot in both the top and bottom walls of said housing,
e. an arm pivotally supported intermediate its ends in said housing,
f. said arm having a lower end portion projecting through the slot in the bottom wall of said housing and having an upper end portion projecting through the slot in the top wall of said housing,
g. reference means on the rounded top wall of said housing adjacent to said slot and having reference points extending through the length of the slot designating various relative speeds of the boat and water in order that the operator can achieve similar trolling speeds from one time to the next,
h. the upper end portion of said arm extending angularly relative to the lower end portion thereof so as to be dis-

posed at one end of said reference means when said lower end portion extends substantially straight downwardly,





i. and drag means connected to the lower end of said arm arranged to engage the water whereby the arm is positioned at different positions with relation to said reference means depending upon the relative speed of the boat and water.

3,871,220

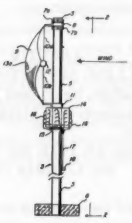
WIND VELOCITY AND DIRECTION APPARATUS

Edwin K. Hillman, 907 W. Desert Cove, Phoeniz, Ariz. 85029

Filed Jan. 2, 1974, Ser. No. 429,492

Int. Cl. G01w *1/02*

U.S. Cl. 73—189 **9 Claims**



1. Mast mounted apparatus for determining the strength and direction of the wind, said apparatus comprising:

a. a fabric body rotatably secured to the mast and rotatable to a downwind position from the mast in response to the wind, said fabric body varying in shape in response to the force of the wind;

b. an electrical contactor for determining the rotational position of said fabric body and reflective of the direction of the wind;

c. a ferrite core surrounded by a movable coil, said coil including means for transmitting an alternating current through said coil;

d. means responsive to the change in shape of said fabric body for repositioning said coil with respect to said ferrite core to vary the reactance of said ferrite core commensurate with the change in shape of said fabric body; whereby, both the force of the wind and the direction of the wind is determinable.

3,871,221

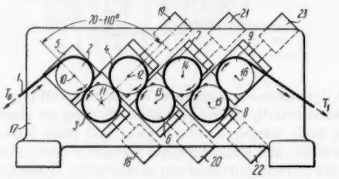
CONTINUOUS STRIP ROLLING MILL

Vladimir Nikolaevich Vydrin, ulitsa Svobody, 139, kv. 7; Leonid Matveevich Ageev, ploschad Mopra, 2, kv. 33, and Vladimir Alexandrovich Gustov, prospekt Pobedy, 298, kv. 56, all of Chelyabinsk, U.S.S.R.

Filed Dec. 27, 1972, Ser. No. 319,054

Int. Cl. B21b *39/08, 1/22*

U.S. Cl. 72—205 **3 Claims**



1. A continuous strip rolling mill comprising: a stand comprising at least three rolls encompassed by a sheet metal strip being processed, the axes of rotation of adjacent cooperating parts of said rolls being located in a common plane, one of said rolls being mounted in stationary chocks; drive means for rotating adjacent rolls in opposite directions with peripheral speeds progressively increasing in the direction of movement of the strip through the mill according to a process flowsheet in such a manner that the peripheral speed of each of the subsequent rolls exceeds the peripheral speed of each of the preceding rolls by the thickness of said metal sheet encompassing a preceding roll exceeds the thickness of said metal sheet encompassing a subsequent roll; first means for tensioning the leading end of said sheet metal strip, located behind said stand, as viewed in the direction of movement of said sheet strip being processed; second means for tensioning the trailing end of said sheet metal strip, located in front of said stand, as viewed in the direction of movement of said sheet being processed; and screw-down means reacting in the plane in which the axes of rotation are located for fixedly adjusting the distance between the axes of rotation of said adjacent rolls, and applying a fixed force sufficient for successive plastic deformation of the strip as it passes through successive pairs of rolls.

3,871,222

METAL ROLLING APPARATUS WITH EXCHANGEABLE ROLLS

Horst Lorenz, Solingen, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany

Filed May 7, 1974, Ser. No. 467,632

Claims priority, application Germany, May 11, 1973, 2323768

Int. Cl. B21b *31/08*

U.S. Cl. 72—238 **4 Claims**

1. In a metal working machine having a roll stand and exchangeably arranged rolls, comprising:

a hollow double acting piston within the stand;

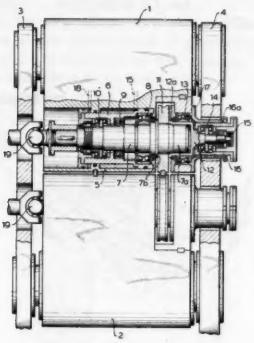
a drive shaft in part rotatably carried within and by said piston;

a roll having a central aperture receiving said shaft therethrough;

abutting means formed on said shaft and bearing against one axial face of said roll,

a rotatably supported journal housing within said roll stand

formed with abutting means bearing against the opposite axial face of said roll;



said shaft having a journal portion protruding into said journal housing and being supported thereby.

3,871,223

SWAGING MACHINE

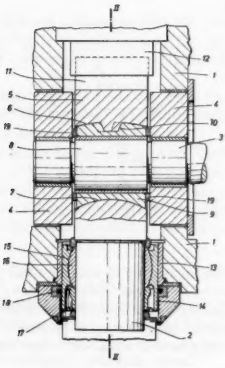
Bruno Kralowetz, and Gottfried Blaimschein, both of Steyr, Austria, assignors to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed Dec. 28, 1973, Ser. No. 429,687

Claims priority, application Austria, Jan. 10, 1973, 175/73

Int. Cl. B21d *43/02*; **B21j** *7/14*, *7/20*

U.S. Cl. 72—402 **5 Claims**



1. A swaging machine for a continuous swaging of elongated workpieces moving along a predetermined path, which comprises

a machine housing surrounding said path,

a plurality of hammers, which are similar to connecting rods and mounted in said housing,

a plurality of eccentrics, each of which is operatively connected to one of said hammers and rotatable to impart to said hammers a reciprocating motion toward and away from said path in a direction which is radial to said path, and an oscillating motion, and

a plurality of slide bearings associated with respective ones of said hammers and permitting of said reciprocating and oscillating motions of said hammers relative to said housing, each of said slide bearings comprising

a sliding member forming a bearing shell,

guide means mounted in said housing and adapted to guide said sliding member in its longitudinal direction toward and away from said path, and

a bearing member which is rigid with the associated hammer and has a curved bearing surface extending in and in bearing contact with said bearing shell to permit of said oscillating motion of said hammer relative to said sliding member.

3,871,224

EXCHANGEABLE CRIMPING JAW UNIT

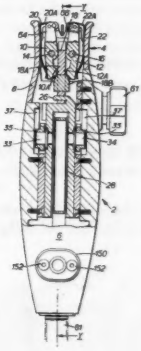
John Leslie Hilton, Ringwood, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland

Filed Nov. 6, 1973, Ser. No. 413,414

Claims priority, application United Kingdom, Nov. 14, 1972, 52421/72

Int. Cl. B21d *37/06*

U.S. Cl. 72—413 **6 Claims**



1. An exchangeable crimping jaw unit for a crimping machine body, said unit comprising in combination a pair of movable crimping jaws and a ram which moves backwards between said jaws to cause said jaws to open and close in a plane at right angles to the direction of movement of said ram, said ram being constructed and adapted to be attached to a ram driving member which is positioned in said crimping machine body and which continues to drive said ram towards said jaws after they have been closed thereby to effect a compressive action in the direction of travel of said ram, and said ram opening and shutting said jaws by means of a cam so arranged in an aperture in the ram that the cam is free to move laterally.

3,871,225

SCREW FORGING PRESS

Horst Bachmann, Rodental Ortsteil Einberg, and Hans Joachim Kossler, Kaarst, both of Germany, assignors to Langenstein & Schemann Aktiengesellschaft, Coburg, Germany

Filed May 28, 1974, Ser. No. 474,102

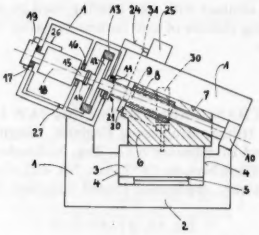
Claims priority, application Germany, June 1, 1973, 2327843

Int. Cl. B21j *9/18*

U.S. Cl. 72—452 **3 Claims**

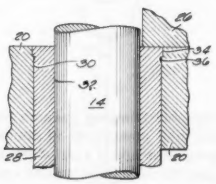
1. A screw forging press comprising: a press frame; a ram movable relative to the press frame; a wedge for acting on the ram to cause the ram to execute a forging stroke; a screw nut associated with the wedge for movement therewith; a screw engaged with the screw nut, rotation of the screw in one sense

causing movement of the nut along the screw in one direction to effect a forward stroke of the wedge for causing the ram to execute a forging stroke and rotation of the screw in the opposite sense causing movement of the screw nut along the screw in the opposite direction to effect a return stroke of the wedge; a flywheel to which the screw is firmly connected; a



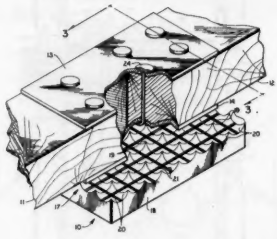
reversible pole-changeable asynchronous motor for rotating the flywheel; a brake for braking the motor; means for controlling the sense of rotation of the motor to thereby control the direction of movement of the wedge; and resilient cushioning means for restraining movement of the wedge during at least part of its return stroke and for assisting movement of the wedge during at least part of its forward stroke.

3,871,226
DIE SET BUSHING RETAINER
Kasimir Janiszewski, 11908 W. Loomis Rd., Franklin, Wis. 53132
Filed Oct. 24, 1973, Ser. No. 409,230
Int. Cl. B21d *37/10*; **B21j** *13/04*
U.S. Cl. 72—456 **7 Claims**



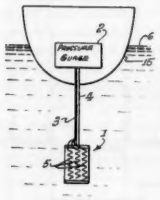
1. An improved die set comprising a die shoe for receiving and supporting a die, a punch holder mounted for reciprocal motion toward and away from said die shoe, a plurality of leader pins each attached at one end to said die shoe and extending therefrom toward said punch holder, a plurality of bushing sleeves each seated in a corresponding bore in said punch holder for slideably receiving a corresponding leader pin to guide said punch holder in its reciprocal motion toward and away from said die shoe, the outside diameter of each bushing sleeve being of such size as to permit the bushing sleeve to be axially reciprocated within the corresponding bore, an enlarged collar on one end of each bushing sleeve, each collar being dimensioned to secure the corresponding bushing sleeve within said bore and each collar being seated within the corresponding bore each of said bushing sleeves having an annular groove at the boundary between said sleeve and said enlarged collar, and the portion of each bushing sleeve adjacent to said collar being distortable under pressure to permit the collar to be bent or broken off in the event that the corresponding leader pin freezes within said bushing sleeve, thereby permitting the frozen bushing sleeve to reciprocate within the corresponding bore to prevent damage to a die attached to said die shoe.

3,871,227
NAIL TURNING APPARATUS
Carl E. Tidwell, Jr., 5800 Riverview Rd., Mableton, Ga. 30059
Filed Nov. 26, 1973, Ser. No. 419,219
Int. Cl. B21c *3/16*
U.S. Cl. 72—476 **2 Claims**



1. A nail turning plate comprising:
a nail impenetrable engaging member having a plurality of elevated regions which define peaks; and
each of said peaks being universally surrounded by arcuate surfaces which descend from the peak to a relatively lower position in contiguous relation to the lower position of an arcuate surface which ascends to an adjacent one of said peaks.

3,871,228
PERMEABLE MEMBRANE GAS SATUROMETER
Ray Franklin Weiss, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 14, 1973, Ser. No. 360,249
Int. Cl. G01n *7/10*
U.S. Cl. 73—19 **6 Claims**



1. Apparatus for measuring in situ the total pressure of gas components present in a large body of water comprising:
a thin-walled gas-permeable membrane sensor formed as an elongate flexible tube having a relatively small internal volumetric area and a relatively large external surface area,
a pressure gauge,
conduit means coupling said internal area to said gauge for conducting internal area gas pressures to the gauge,

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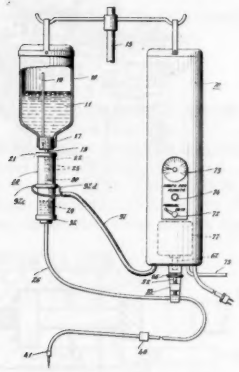
3,871,229
DROP SENSING APPARATUS
John H. Fletcher, Stamford, Conn., assignor to Data Service of America, Inc., Norwalk, Conn.
Filed Jan. 2, 1974, Ser. No. 429,788
Int. Cl. G01f *1/00*; **A61m** *5/16*
U.S. Cl. 73—204 **6 Claims**

1. Apparatus for sensing the passage of liquid drops successively falling along a predetermined vertical path, said apparatus comprising:

A. an enclosure including means for establishing a vertical drop path; and

B. a probe mounted within the enclosure and having a portion positioned directly in the drop path, said probe comprising

1. an electrically conductive element located in that portion of the probe which is positioned in the drop path, the conductivity of the element being significantly variable with its temperature,



2. a pair of leads connected with the conductive element and having terminals outside the enclosure for conducting current to and from the conductive element, and

3. insulating material enclosing both the conductive element and the portion of the leads within the said enclosure and electrically isolating them from falling drops, such material being, however, of such thinness in the vicinity of the conductive element as not significantly to isolate the element from thermal gradients created by drops falling successively on that portion of the probe which is positioned in the drop path.

3,871,230

FLOW MEASURING APPARATUS

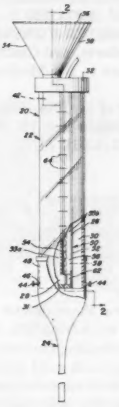
John F. Dye; William J. Binard, both of Barrington, and Leonard R. Anglada, Arlington Heights, all of Ill., assignors to The Kendall Company, Walpole, Mass.

Filed May 14, 1973, Ser. No. 360,214

Int. Cl. G01f *1/00*

U.S. Cl. 73—215 **23 Claims**

1. An apparatus for measuring the approximate peak flow rate of a liquid discharge comprising, a hollow receptacle having an inlet port adjacent the upper end of the receptacle to receive the liquid discharge, a compartment below the inlet port to receive the discharge passing through the inlet port, a channel adjacent said compartment, and an upright wall in the receptacle separating the compartment from the channel, said wall having vertically disposed opening means communicating between the compartment and channel to permit passage of liquid from the compartment to the channel as the liquid collects in the compartment, wettable means for indicating the maximum height of liquid collected in the compartment during the discharge to determine the approximate peak flow rate of the liquid discharge, and means for preventing the incoming



liquid discharge from directly contacting a substantial portion of the indicating means.

3,871,231

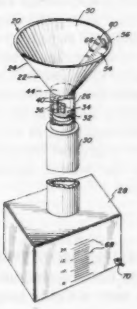
FLOW MEASURING DEVICE

Anthony J. Ciarico, Waukegan, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed May 14, 1973, Ser. No. 360,217

Int. Cl. G01f *1/00*

U.S. Cl. 73—215 **11 Claims**



1. A device for measuring the approximate peak flow rate of a liquid discharge, comprising:

a body member having an inlet opening adjacent the top of the member to receive the liquid discharge, and a cavity extending from said inlet opening through the member;

a plate extending across the body member in said cavity below the inlet opening, said plate having aperture means extending through the plate for passage of liquid;

a plurality of tubes extending upwardly from the plate toward said inlet opening, each of said tubes having different lengths and communicating with the remote side of the plate relative said inlet opening for passing liquid in the tubes through the plate;

means intermediate the inlet opening and said plate wettable for indicating the maximum height of liquid reached in the body member during the liquid discharge to determine the approximate peak flow rate of the discharge into the body member; and

means for preventing the incoming liquid discharge from directly a substantial portion of the indicating means.

3,871,232

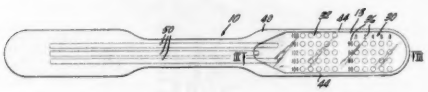
THERMOMETER CONSTRUCTION

Charles G. Pickett, Andover, and Ghazi Khattab, Parsippany, both of N.J., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 300,868, Oct. 25, 1972, abandoned. This application Oct. 15, 1973, Ser. No. 406,146

Int. Cl. G01k *11/12, 11/08*

U.S. Cl. 73—356 **4 Claims**



1. In an elongated oral thermometer having

a handle end and a measuring end, the measuring end including a heat conducting carrier in which a plurality of cavities are defined with solid solutions of the same two organic compounds in various composition ratios deposited in the cavities, the solid solutions having an essentially linear melting point-to-composition relationship over the composition range represented by the plurality of solutions,

an indicator associated with each cavity to visually signal the melting of solid solution in that cavity, the cavities and associated indicators being spaced in a series of rows parallel to the longitudinal axis of the thermometer in a grid arrangement with each indicator corresponding to a point on the grid, and

such temperature indicia associated with the indicators that each row indicates a different temperature range and all points in a row denote a regular progression of like temperature increments within that range,

the improvement comprising the disposition of the highest temperature indicia for any given row being towards the measuring end of the thermometer and the lowest temperature indicia for the same row towards the handle end of the thermometer the various composition ratios for the solid solutions being such that the difference in the melting points of solid solutions in any two adjacent cavities in the same row is greater than the temperature increment shown by the indicia associated with those two adjacent cavities.

3,871,233

FLUID PRESSURE MONITORING DEVICE

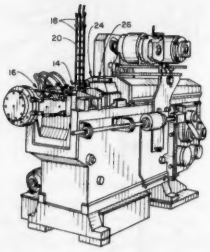
Elpidifor Paramonoff, Los Angeles, and Frederick C. Olsen, Huntington Beach, both of Calif., assignors to Standun, Inc., Compton, Calif.

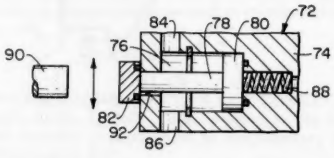
Filed Sept. 17, 1973, Ser. No. 397,613

Int. Cl. G01l *7/16*

U.S. Cl. 73—389 **8 Claims**

1. In a fluid pressure monitoring device for a machine and the like, the combination of: a machine moving part movable in a preset path of movement; a machine stationary part aligned adjacent said preset path of movement; a housing; a main fluid chamber formed in said housing; a plunger in said main fluid chamber reciprocal between first and second positions; operating fluid supply means communicating into said main fluid chamber and directing operating fluid against said plunger tending to urge said plunger toward said first position, said operating fluid normally being under a pressure above a predetermined minimum operating pressure exerting at least a part of a minimum total pressure force against said plunger retaining said plunger in said first position; monitoring pressure means operably connected to said plunger exerting a monitoring total pressure force against said plunger slightly less than said minimum total pressure force tending to urge said plunger toward said second position, said monitoring pressure means moving said plunger toward and into said second position when said pressure of said operating fluid drops below said predetermined minimum operating pressure; sensing means for sensing said plunger movement from said first toward said second position when said sensing means and said housing are generally adjacent, said sensing means including proximity sensor means spaced at all times from said plunger, said proximity sensor means being in a first condition when said plunger is in said first position and converting to a second condition during and after movement of said plunger





from said first position into said second position upon said proximity sensor means and said housing becoming generally adjacent; said housing and said proximity sensor means being mounted one on said machine moving part moving in said preset path of movement with said machine moving part and one on said machine stationary part aligned adjacent said preset path of movement of said machine moving part, said proximity sensor means sensing said plunger movement into said second position and converting into said second condition when said housing and said proximity sensor means are generally adjacent in said movable machine part movement.

3,871,234

DYNAMIC BALANCING MACHINE

Christian Langlois, Castres, France, assignor to Regie Nationale des Usines Renault, Billancourt, France

Filed Sept. 11, 1973, Ser. No. 396,142

Claims priority, application France, Dec. 10, 1972, 72.36177

Int. Cl. G01m *1/16, 1/20*

U.S. Cl. 73—460 **7 Claims**

1. A balancing machine comprising:

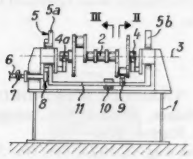
means for supporting a part to be balanced for rotation about an axis and lateral movement in a plane called the clearance plane;

drive means for rotating the part to be balanced;

two components for generating imbalance, each of said components comprising a mass to orbit about an axis which is stationary with respect to the supporting means, each of said masses having a plane defined by its centre of gravity and its axis of rotation,

means mounting said masses for rotation about parallel axes while in antiphase relation at least when said planes are parallel,

means driving said masses synchronously with the part to be balanced; and



means mounting at least one of said components for movement relative to the supporting means.

3,871,235

DISTANCE OR SPEED MEASURING APPARATUS FOR LAND-VEHICLES

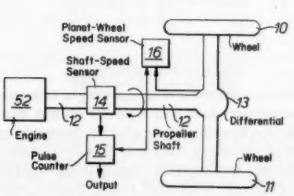
Edward William Anderson, Cheltenham, England, assignor to Smiths Industries Limited, London, England

Continuation of Ser. No. 49,136, June 23, 1970, abandoned. This application June 12, 1972, Ser. No. 261,755

Claims priority, application Great Britain, June 27, 1969, 32505/69

Int. Cl. G01p *3/04, 3/56*

U.S. Cl. 73—510 **7 Claims**



7. Apparatus for providing a manifestation representative of movement of a land-vehicle of the type having two traction members comprising, a source of motive power for driving both said traction members, and a differential for conveying drive from said source to said traction members, said differential including an input shaft coupled to said source, two output shafts that are coupled respectively to said traction members, and means rotatable in accordance with any difference between the speeds of rotation of said two output shafts, the apparatus further including:

a first speed sensor responsive to the speed of rotation of said input shaft of the differential to provide a first manifestation in accordance with said speed,

a second speed sensor responsive to rotation of said rotatable means of the differential to provide a second manifestation dependent upon the difference in speed between the two output shafts arising from slip of either of said traction members, and

output means for providing a representation of movement of the vehicle in accordance with the speed of the slower of the two traction members in the presence of said slip, said output means being responsive to said first manifestation to provide said representation and being also responsive to said second manifestation to effect a reduction on said representation in accordance with said difference so as thereby to relate said representation to the slower-speed traction member.

3,871,236

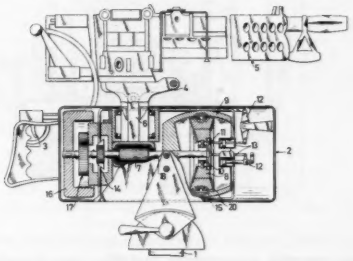
DEVICE FOR THE MECHANICAL STABILIZATION OF THE ALIGNMENT OF INSTRUMENTS

Juan J. de la Cierva, Apolonio Morales 21, Madrid, Spain

Filed Apr. 5, 1973, Ser. No. 348,171

Int. Cl. G01c *19/46*

U.S. Cl. 74—5.22 **7 Claims**



1. A system for mechanically stabilizing the alignment of instruments with line of sight comprising a vertical support having an upper extremity, a stabilizer means mounted on said upper extremity for movement in vertical and horizontal directions, for maintaining the line of sight of an instrument mounted thereon in constant alignment with a target with interference-free transmission to said instrument of aiming movements communicated by an operator to the stabilizer device, while preventing the stabilized instrument from undergoing sudden movements to which said vertical support and said stabilizer device may be subjected when mounted in a moving vehicle of any kind; said stabilizer means including a housing, an actuating motor, mounted in said housing and having a projecting shaft extending from opposite side thereof and defining first and second shaft end portions, a partly spherical drum rigidly secured to said first end of the shaft of the actuating motor for rotation therewith, a gyroscope rotatably mounted on said shaft within said partly spherical drum; means for mounting said gyroscope on said shaft for rotation therewith, said mounting means including a universal joint, a reaction flywheel mounted on said second end of said shaft and driven by said motor for counteracting the couples originating in the rigid components of the motor and of the partly spherical drum when said stabilizer means is subjected to a sudden displacement; and means for transmitting the relative displacement of the gyroscope in relation to the partly spherical drum to the instrument to be stabilized including hydraulic transmission means and a disc concentrically mounted in said gyroscope to remain in the same plane therewith; said hydraulic transmission means being operatively connected between said disc and said instrument to transmit to the instrument the position of said gyroscope, whereby the line of sight of said stabilized instrument will be maintained in alignment with the target, independently of sudden movements of the support system.

3,871,237

TUNER DRIVE ASSEMBLY WITH INERTIAL FINE TUNE STABILIZER

Carroll R. Miner, Wilbraham, Mass., assignor to General Instrument Corporation, Newark, N.J.

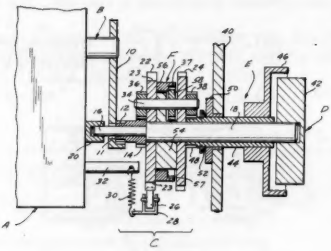
Filed Mar. 4, 1974, Ser. No. 447,975

Int. Cl. F16h *35/18*

U.S. Cl. 74—10.54 **8 Claims**

1. A tuner drive assembly for use with a tuning element conditionable to select a particular frequency by the movement of an input member comprising movable coarse tuning means, movable fine tuning means adapted to move when said coarse tuning means is moved, drive means operably connected to said coarse tuning means, said fine tuning

means and said input member and adapted to drive said input member in accordance with the movements of said coarse tuning means and said fine tuning means respectively, said fine tuning means having a given inertial effect on said drive means during the movement of said coarse tuning means, and inertia



means operably connected to said drive means and said fine tuning means and movable relative to the latter during movement thereof, said inertia means having an inertial effect on said drive means during meovement of said coarse tuning means substantially equal to but in an opposite sense from said given inertial effect.

3,871,238

INTERMITTENT MOTION MECHANISM

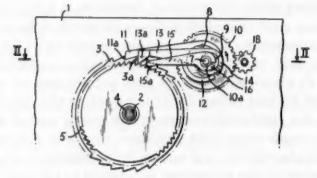
Kiysohi Kitai, Tokyo, Japan, assignor to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed June 11, 1973, Ser. No. 368,530

Claims priority, application Japan, June 9, 1972, 47-57440

Int. Cl. F16h *27/00*

U.S. Cl. 74—112 **1 Claim**



1. An intermittent motion mechanism comprising: a first rotary ratchet wheel having disposed therearound a first set of ratchet teeth and having an intervening tooth space between each two successive ratchet teeth; a second rotary ratchet wheel having disposed therearound a second set of ratchet teeth and having an intervening tooth space between each two successive ratchet teeth, at least one of said tooth spaces being deeper than the remaining tooth spaces; means mounting said first and second ratchet wheels in side-by-side relationship for rotational movement independently of each other and mounting said first and second ratchet wheels in mutually relative positions so that said second ratchet wheel may be cyclically moved into an actuating position wherein the deeper tooth space is in alignment with one of the tooth spaces between successive ratchet teeth of said first ratchet wheel; means reciprocable into engagement with said second set of ratchet teeth to effect intermittent angular movement of said second ratchet wheel through a plurality of angular increments to cyclically advance same to said actuating position and reciprocable into concurrent engagement with both said first and second sets of ratchet teeth when said second ratchet wheel is in said actuating position to effect intermittent angular movement of both ratchet wheels through one angular increment; whereby said first and second ratchet wheels are intermittently rotated in a stepwise manner at different rates, and said last-mentioned means comprising a pair of feeding pawls one of which engages only with said first set of ratchet teeth and the other of which engages with both said first and second sets of ratchet teeth.

3,871,239

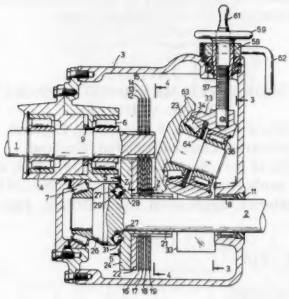
VARIABLE SPEED DRIVE

Horst G. Steinhagen, Racine, Wis., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Aug. 2, 1973, Ser. No. 385,062

Int. Cl. F16h *15/08*

U.S. Cl. 74—199 **5 Claims**



1. A variable speed drive comprising a transmission housing; a power input shaft and a power output shaft rotatably mounted in said housing on parallel, transversely spaced axes; first stacks of relatively rotatable radially interleaved axially flexible torque transmitting laminations operatively connected, respectively, with said shafts; second stacks of relatively rotatable radially interleaved axially flexible torque transmitting laminations operatively connected, respectively, with said shafts in axially spaced relation to said first stacks; annular race members respectively surrounding said shafts in the space between said first and second stacks of interleaved laminations; a carrier frame for said race members mounted within said housing for back and forth adjustment transversely of said shafts; said race members being rotatably mounted in said carrier frame in cooperable, axial thrust transmitting relation, respectively, with said first and second lamination stacks; abutment discs at the axially outer sides, respectively, of said first and second lamination stacks; and pressure means operable to compress said first lamination stacks between the adjacent abutment disc and one of said race members, and to simultaneously compress said second lamination stacks between the adjacent abutment disc and the other of said race members.

3,871,240

POWER TRANSMISSION BELTS

Werner D. Schnackenberg, Englewood, and James M. Lane, III, Aurora, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

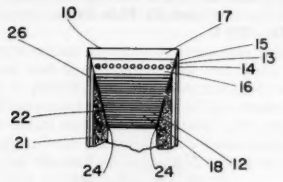
Filed Mar. 11, 1971, Ser. No. 123,275

Int. Cl. F16g *5/00;* **B29h** *7/22;* **B36b** *27/40*

U.S. Cl. 74—234 **28 Claims**

1. A unitary molded power transmission belt comprising: a polymer body having a compression section, a neutral axis and a tension section;

discrete protrusions of fiber extending beyond the lateral edge surface of the body portion of said belt, and said



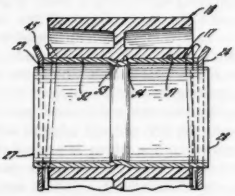
fiber protrusions being substantially free from inclusion of body polymer.

3,871,241

TAKE-UP PULLEY

John August Pestka, Park Ridge, and Richard Jay Lindeman, Elmwood Park, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 23, 1974, Ser. No. 435,794
Int. Cl. F16h *7/12, 55/36, 55/48*
U.S. Cl. 74—242.11 R **12 Claims**



1. An idler take-up pulley comprising a bearing support fork, a bearing and a pulley wheel, the bearing support fork being adapted for attachment to a frame and including biasing means for urging the pulley wheel toward a maximum slack take-up position against the action of a belt member passing over the pulley, the bi-ended, one-piece, cylindrical bearing being carried between the fork tines, each bearing end including at least one finger for engaging a slot in an abutting fork tine to mount the bearing on the fork and to immobilize the bearing from rotational motion relative to the fork tine, and at least one recessed surface for abutting the fork tine to immobilize the bearing from axial motion relative to the fork tine, and a groove medially disposed around the bearing surface, the pulley wheel having an annular radially inwardly extending ring mating with the bearing groove to axially locate the pulley on the bearing.

3,871,242

SIMPLIFIED DRIVE MECHANISM FOR ICE MAKER

William J. Linstromberg, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

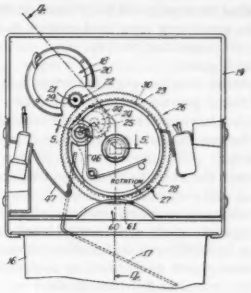
Filed Jan. 16, 1974, Ser. No. 433,918
Int. Cl. F16h *1/20*
U.S. Cl. 74—421 A **12 Claims**

1. In an ice maker having a drivable ice body tray mechanism, a control mechanism for controlling cyclical operation of the ice maker, and a motor drive, means for maintaining synchronization of said tray and control mechanism comprising:

drive means for driving said tray mechanism;

timing means driven by said drive means for timing said control mechanism; said timing means locked in driven association with said drive means;

means for releasably connecting said motor drive in driving association with said drive means whereby said timing



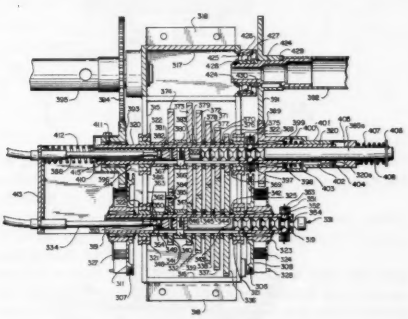
means is maintained synchronized with said drive means when said motor drive is disconnected from said drive means.

3,871,243

TRANSMISSION FOR OCCUPANT-PROPELLED VEHICLES

Robert L. Bundschuh, and Lionel C. Martin, both of West Simsbury, Conn., assignors to Pedicar Corporation, Windsor, Conn.

Filed Mar. 6, 1973, Ser. No. 338,644
Int. Cl. F16h *3/80*
U.S. Cl. 74—357 **6 Claims**



1. In a transmission of the type described, the combination of

an input shaft;

an output shaft;

two driven shafts;

housing means,

said input shaft and said output shaft being mutually parallel and mounted on said housing means for rotation about their respective axes;

a plurality of input gears carried by said input shaft and normally free to rotate thereon;

a plurality of output gears carried by said output shaft and normally free to rotate thereon,

the input gears each being meshed with a corresponding one of said output gears;

a first device operatively associated with said input shaft to secure any selected one of said input gears to said input shaft to rotate therewith;

a second device operatively associated with said output shaft to secure any selected one of said output gears to said output shaft to rotate therewith;

control means for actuating said first and second devices simultaneously whereby, in response to operation of said control means, only a selected input gear and the output gear meshed therewith will be secured to their respective shafts, the remaining input and output gears then being free of their respective shafts;

two additional gears;

two overrunning clutches each mounting a different one of said additional gears on said output shaft,

said clutches being oriented to drive said additional gears only when said output shaft rotates in a predetermined direction;

said two driven shafts being mutually coaxial and extending parallel to said output shaft,

the mutually adjacent end portions of said driven shafts being spaced apart and located each in overlapping relation to a different end portion of said output shaft; two driven gears each fixed to said end portion of a different one of said driven shafts;

two bearings each rotatably supporting a different one of said end portions of said driven shafts; and

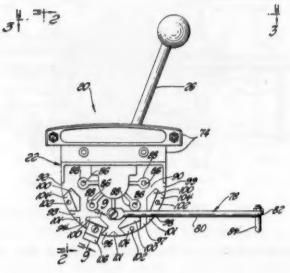
support means mounting said bearings in positions such that said two driven gears are meshed respectively with said two additional gears.

3,871,244

LEVER CONTROL ASSEMBLY

Charles F. Gressard, Kent, and Charles M. Schiff, Mentor, both of Ohio, assignors to Teleflex Incorporated, North Wales, Pa.

Filed Sept. 18, 1973, Ser. No. 398,407
Int. Cl. G05g *1/04, 7/00, 9/00*
U.S. Cl. 74—491 **58 Claims**



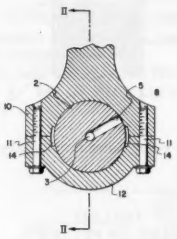
1. A lever control assembly comprising; housing means adapted for attachment to a support structure, actuator means movably supported by said housing means, bearing means interconnecting each of opposite sides of said actuator means and said housing means, said actuator means having a compartment therein between said bearing means, lever means disposed in said compartment and extending from said actuator means for moving said actuator means relative to said housing means, each of said bearing means including a circular shaft integral with and extending from one of said housing means and said actuator means and a circular cavity in the other for receiving said shaft, and a seal comprising an annular projection extending about each shaft and movably disposed in a mating annular groove.

3,871,245

CONNECTION ROD BEARING FOR INTERNAL COMBUSTION ENGINES

Delbert R. McKindree, 309 Ridge Ave., Butler, Pa. 16001

Filed Mar. 25, 1974, Ser. No. 454,569
Int. Cl. F16c *7/02*
U.S. Cl. 74—579 E **4 Claims**



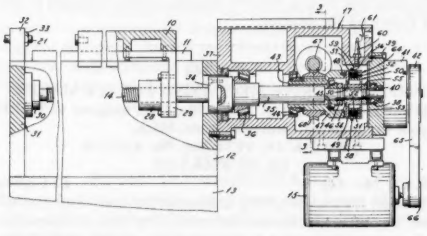
1. A connecting rod for use with a reciprocating piston type of internal combustion engine in which the cranks have an axial lubricant passage therethrough with a radial discharge port designed to discharge lubricant at the periphery of the crank, said connecting rod having a crank engaging terminal comprising a yoke-like integral end of the connecting rod together with a complementary cap member fixed to the yoke-like connecting rod end, the yoke and cap defining an opening in which the crank with which the rod is used is received, the opening having an integral bearing quadrant therein on the yoke-like end and another such quadrant diametrically opposite the first one and integral with the cap, said two quadrants providing a working fit around the crank when it is received in said opening, the two quadrants being spaced from each other by diametrically opposite open-ended cross grooves, the lubricant discharge port in a crank so received in the connecting rod opening being positioned to be closed by the bearing quadrants during the rotation of the crank in the connecting rod but free to momentarily discharge lubricant into said cross grooves at those angles in the rotation of the crank where the port is exposed to one of the grooves.

3,871,246

MACHINE TOOLS

Donald R. Craven, Rockford, Ill., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,658
Int. Cl. F16h *37/06*
U.S. Cl. 74—665 GD **6 Claims**



1. In a machine tool, the combination comprising

the base,

a support movable on the base,

a fixed stop on the base,

a lead screw on said base for moving the support on the base toward and away from the stop,

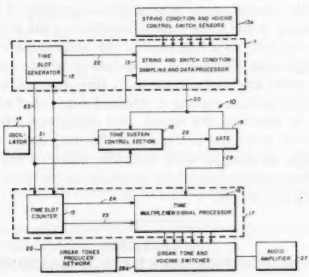
first drive means operable to drive the lead screw at a first speed,
second drive means operable to drive the lead screw at a second speed less than the first speed,
first clutch means energizable to provide a driving connection between said second drive means and said lead screw,
second clutch means provided between said second drive means and said first clutch means and being normally operable to provide a driving connection between said second drive means and said first clutch means,
said second clutch means being operable upon engagement of the support with the stop with a predetermined force to disengage the drive between said second drive means and said first clutch means,
said second clutch means comprising a worm,
bearing means mounting said worm for unlimited rotation and limited axial movement,
a worm wheel meshing with said worm and with said lead screw,
and a clutch providing a driving connection between said second driving means and said worm,
the helix angle of the worm and the worm wheel being such as to preclude driving of the worm by the worm wheel,
said last-mentioned clutch comprising a first clutch member connected to said second driving means
a second clutch member connected to said worm,
said first and second clutch members being engaged and disengaged by axial motion of said worm,
spring means urging the worm axially to engage said first and second clutch members and to maintain the clutch members in engagement when the load on the worm wheel does not exceed a predetermined maximum,
said spring being adapted to permit disengagement of the clutch member when the worm wheel stops due to excess torsion load thereby causing the worm to move axially relative to the worm wheel and causing the moment of inertia of the worm and associated parts to overrun the worm such as to disengage the clutch members.

3,871,247

MUSICAL INSTRUMENT EMPLOYING TIME DIVISION MULTIPLEXING TECHNIQUES TO CONTROL A SECOND MUSICAL INSTRUMENT

Arthur R. Bonham, 5614 Lejeune Dr., Orlando, Fla. 32808

Filed Dec. 12, 1973, Ser. No. 423,935
Int. Cl. G10h *1/00, 5/00*
U.S. Cl. 84—1.16 **5 Claims**



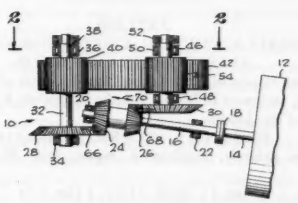
1. In a combination comprising a guitar having strings with musical tones that are manually and selectably playable thereon, a second musical instrument having means for producing audible tones which are harmonically related to said musical tones, and a system for controlling the operation of the tones producing means in accord with the selected play of said musical tones on said strings, the improved control system comprising encoding means for detecting the play of said musical tones on said strings during each of successively occurring time frames and for generating a series of time multiplexed signals during each of said time frames, each of said time frames having a plurality of time slots, each of said musical tones being assigned to a respective one of said time slots, and each of said signals being generated in response to the detected play of a respective one of said musical tones on a string of the guitar and during the occurrence of the time slot assignment of said one tone; decoding means for decoding the time multiplexed signals and controlling the audible tones producing means to produce audible tones harmonically related to the musical tones assigned to the time slot occurrences of said time multiplexed signals, means for transmitting said time multiplexed signals from said encoding means to said decoding means, and manually controllable means for sustaining the production of audible tones during subsequent time frames which are harmonically related to the musical tones assigned to the time slot occurrences of the multiplexed signals generated during a time frame preceding said subsequent time frames.

3,871,248

TWO-POWER-PATH BEVEL GEARING FOR HIGH LOADS AND HIGH SPEEDS

Thomas Barish, 5411 Tyrone Ave., Van Nuys, Calif. 91401

Filed Aug. 13, 1974, Ser. No. 496,922
Int. Cl. F16h *37/06, 57/00, 1/14*
U.S. Cl. 74—665 P **15 Claims**



1. A plural power path bevel gear train comprising:
a radially supported and axially free bevel pinion shaft for rotation by a prime mover;
first and second bevel pinions fixed to said bevel pinion shaft in opposed relationship for initiating first and second power paths in said gear train; and
first and second bevel gears respectively in said first and second power paths, said first and second bevel gears being respectively in tooth engagement with said first and second bevel pinions, said tooth engagement being such that the division of torque through said first and second power paths is a function of axial position of said pinion shaft and said first and second pinions thereon with respect to said first and second bevel gears, and the axial position of said pinion shaft is automatically controlled by the balance of axial thrust forces on said bevel pinions by said bevel gears produced by torque transmitted from said bevel pinions to said bevel gears.

3,871,249

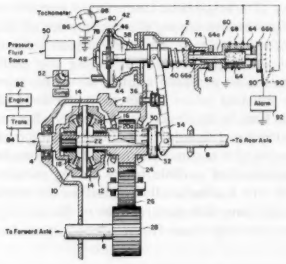
LOCK-UP DIFFERENTIAL INCLUDING SPEED-RESPONSIVE INHIBITING MEANS

Ellis E. Jeffers, Farmington, Mich., assignor to Aspro, Incorporated, Westport, Conn.

Filed Mar. 1, 1974, Ser. No. 447,325
Int. Cl. F16h *1/44;* **B62d** *61/00;* **F16d** *23/00*
U.S. Cl. 74—711 **11 Claims**

1. In a differential mechanism of the lock-up type driven by an engine shaft and including a housing, an input shaft rotatably connected with said housing, differential means driven by

said input shaft, said differential means including first and second differential shafts, and lock-up means operable alternately between disengaged and engaged conditions to disconnect and connect said second differential shaft with said first differential shaft, thereby to release and to lock-up the differential means, respectively; the improvement which comprises inhibiting means for preventing said lock-up means from connecting said second differential shaft with said first differential shaft when the speed of one of said engine and input shafts exceeds a given value, whereby damage to said lock-up means at high shaft speeds is avoided.



3,871,250

HYDRAULIC CONTROL CIRCUIT FOR VEHICLE AUTOMATIC TRANSMISSION

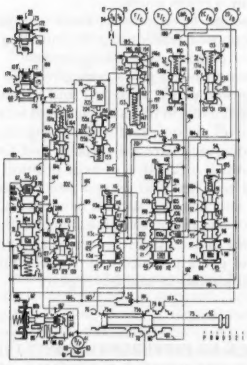
Toshiyuki Miyauchi, and Kunio Ohtsuka, both of Yokohama, Japan, assignors to Nissan Jidosha Kabushiki Kaisha, Yokohama City, Japan

Filed Oct. 19, 1973, Ser. No. 408,014

Claims priority, application Japan, Oct. 28, 1972, 47-108369

Int. Cl. B60k *21/02*; **F16h** *3/74*

U.S. Cl. 74—869 **4 Claims**



1. In a hydraulic control circuit for a vehicle automatic transmission of the type wherein a plurality of shift control valves selectively deliver hydraulic fluid to a plurality of frictional elements to cause engagement and disengagement of said frictional elements having a first pressure-regulating means and a throttle valve responsive to the vehicle engine load interposed between a main supply pump and the shift control valves, the improvements comprising:

a. a second pressure regulating means having an inlet connected to an outlet of said first pressure regulating means, and an outlet,

b. a third pressure regulating means having inlets connected to said second pressure regulating means outlet and said throttle valve, and an outlet connected to an inlet of said first pressure regulating means,

c. means to control said second pressure regulating means in response to the position of the vehicle accelerator pedal such that when the pedal is in an idle position or returning to an idle position, said second pressure regulating means transmits hydraulic fluid through said third pressure regulating means to said first pressure regulating means to cause said first pressure regulating means to lower the pressure of the hydraulic fluid supplied to said shift control valves, and

d. means to control said third pressure regulating means.

3,871,251

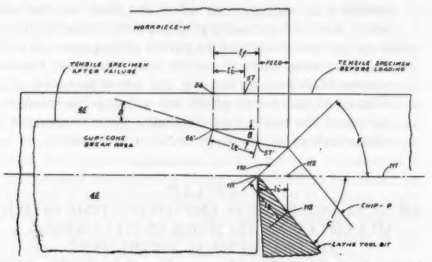
CUTTING TOOL FOR THE CONTINUOUS MACHINING OF METALS AND THE METHOD OF MAKING SAME

William L. Mundy, St. Louis, Mo., assignor to O'Fallon Investment Company, Maryland Heights, Mo.

Division of Ser. No. 304,771, Nov. 8, 1972, which is a continuation-in-part of Ser. No. 45,357, June 11, 1970, abandoned. This application June 24, 1974, Ser. No. 482,608

Int. Cl. B21k *21/00*; **B26d** *1/00*; **B23b** *3/00*

U.S. Cl. 76—101 A **2 Claims**



1. A method of forming a cutting tool for machining a selected metal comprising the steps of subjecting a sample of metal to be cut to tensile loading until the sample fails, determining the magnitude of the neck down angle at the failure area of the sample, determining the magnitude of elongation of the sample in the failure area, establishing the effective rake angle of the tool as a function of the magnitude of the neck down angle and elongation, establishing a side land surface having a relief angle of substantially zero degrees, establishing a side relief surface having a selected side relief angle, using the tool to machine the metal, and selectively changing the width of the side land surface and the magnitude of the side relief angle as needed such that the width of the side land surface becomes substantially constant as the tool is used for machining the metal.

3,871,252

SCREW THREAD CUTTING MACHINE

Erwin S. Nann, Esslingen, Germany, assignor to Cri-Dan, Paris, France

Filed Aug. 10, 1973, Ser. No. 387,275

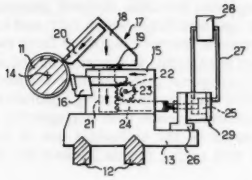
Claims priority, application Germany, Aug. 12, 1972, 2239856

Int. Cl. B23b *21/00*

U.S. Cl. 82—25 **11 Claims**

1. In a screw-thread cutting machine, comprising a frame in which a workpiece can be mounted for rotation about an axis,

a fixed first guide means on the frame, a longitudinal slide mounted on the first guide means for guided movement in a first direction parallel to said axis, a cross-slide mounted on the longitudinal slide for guided movement relative thereto in a second direction normal with respect to said axis, a first tool holder mounted on the cross-slide, a second tool holder



mounted on the cross-slide and movable relative to the cross-slide in a third direction normal to said first and second directions, and means for automatically moving the second tool holder in said third direction in response to movement of the cross-slide relative to the longitudinal slide, the second tool holder being adapted to support a cutting tool at an angle to a cutting tool carried by the first tool holder.

3,871,253

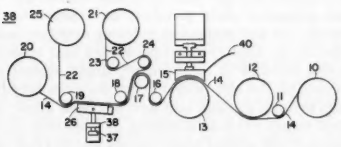
SLITTING OF AN ELECTRICALLY CHARGED TAPE

William Pryce, Amherst, Nova Scotia, and Eric Foster, London, Ontario, both of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Division of Ser. No. 299,637, Oct. 20, 1972, Pat. No. 3,808,919. This application Feb. 19, 1974, Ser. No. 443,362

Int. Cl. B26d *3/08*

U.S. Cl. 83—8 **2 Claims**



1. Apparatus for slitting an electrically charged tape, comprising:

a slitter having two cutting blades spaced a predetermined distance apart,

means for passing an electrically charged metallized tape in slitting relationship with said slitter;

means for feeding a metallized support tape into contact with the charged tape, prior to slitting, whereby the two tapes will be in contact during slitting;

means for separating the tapes after slitting, the tapes when in contact arranged so that the metallized layers are separated by the backing layer of a tape; and

means for adjusting the slitter to control the degree of penetration of the cutter blades into said further metallized tape, the charged tape completely slit through and the support tape partially slit through.

3,871,254

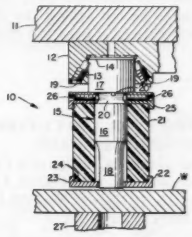
MEANS FOR PIERCING AND STRIPPING THICK MATERIAL

Lawrence V. Whistler, Jr., 251 Doncaster Rd.; Lawrence V. Whistler, III, 368 Argonne Dr., both of Kenmore, N.Y. 14217, and Harold J. Whistler, 22 Highland Dr., Williamsville, N.Y. 14221

Filed Apr. 13, 1973, Ser. No. 350,789

Int. Cl. B21d *45/00;* **B26f** *1/02*

U.S. Cl. 83—139 **9 Claims**



1. A punch for punching holes in material, comprising:

punch retaining means,

a punch having a head end and a piercing end,

punch securing means engaged with the head end of the punch securing the punch to the punch retaining means, axially downwardly facing shoulder means on the punch adjacent the head end thereof axially spaced from the punch retaining means, and

resiliently yieldable stripper means disposed in substantially coaxial relation with the punch, said stripper means including a cap means secured to the punch in coaxial relation therewith in engagement with said shoulder means and axially spaced from the punch retaining means, said yieldable stripper means engaged at one end against said cap means and having its other end substantially coplanar with the piercing end of the punch, so that when said punch is forced through a piece of material to pierce the material the stripper means engages between the piece of material and the cap means and thus acts as a shock absorber absorbing forces resulting from piercing the piece of material and effecting stripping of the pierced piece of material from the punch, with stripping loads imposed on the stripper means transmitted to the shoulder means on said punch to thus protect the punch securing means supporting said punch in said punch retaining means.

3,871,255

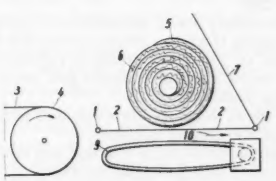
DEVICE FOR CUTTING PEAT BAND ROLLS

Pentti Samuel Nisula, Hamevaara, Finland, assignor to Lannen Sokeri Oy, Lansi-Sakyla, Finland

Filed May 30, 1973, Ser. No. 365,184

Int. Cl. B26d *7/06, 4/76, 1/46*

U.S. Cl. 83—155 **6 Claims**



1. A device for cutting peat band rolls or the like, said device having a frame comprising: a chain saw mounted on the

frame of the device, said chain saw being substantially horizontal and the cutting plane of the saw being vertical, a pair of supporting elements each being pivotally mounted at one end thereon above said chain saw, said supporting elements having their pivot axes substantially perpendicular to the vertical plane of said chain saw, said supporting elements supporting the item to be cut above said chain saw and having free ends adjacent each other, said free ends being located substantially midway between the ends of said chain saw, and means for pivoting said supporting elements towards said chain saw to move the said free ends away from each other and to lower the item to be cut against the chain saw, said support plates supporting the peat band roll during the cutting operation.

3,871,256

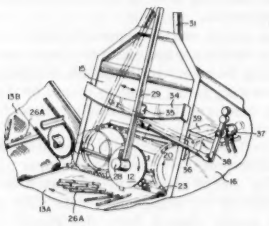
SUGAR CANE CONVEYOR AND CUTTER FOR CUT WINDROWED CANE

Harold A. Willett, Thibodaux, La., assignor to Cane Machinery & Engineering Company, Inc., Thibodaux, La.

Filed May 30, 1972, Ser. No. 258,123

Int. Cl. A01d *55/18*

U.S. Cl. 83—355 **7 Claims**



1. An apparatus for picking up windrowed cane and cutting the stalks into shorter units comprising longitudinal inclined conveyor means for moving previously harvested cane stalks along their major axis, pendulously mounted cane stalk incising means positioned at the upper end of said inclined conveyor means to cut the cane stalks received at the top of said inclined conveyor into smaller units while said stalks are being moved axially along the conveyor, and transverse conveyor means positioned to receive the smaller cut stalks and convey same transversely of the apparatus.

3,871,257

WEB CUTTING DEVICE

Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Filed Oct. 26, 1973, Ser. No. 410,157

Claims priority, application United Kingdom, Oct. 31, 1972, 50096/72

Int. Cl. B23d *25/16;* **B26d** *1/56*

U.S. Cl. 83—285 **5 Claims**

1. A supplementary device mountable on a packaging machine for wrapping block-like articles in wrappers of material cut from webs, the device comprising, in combination:

mounting means adapted to mount said device on such packaging machine;

first guide means to define a first web feed path for a first web to such packaging machine;

second guide means to define a second web feed path for a second web to such packaging machine;

first web feeder means selectably operable to feed a first web along said first feed path;

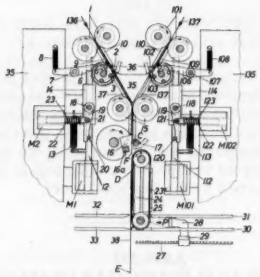
second web feeder means selectably operable to feed a second web along said second feed path;

first cutter means disposed in said first path;

second cutter means disposed in said second path;

said first and said second cutter means each comprising a generally disc-shaped member rotatably displaceable relatively to a second member to bring mutually co-operable knife elements of said first and said second members into co-operative action, said generally disc-shaped member of each said cutter means having a plurality of individual ones of said knife elements spaced around the periphery thereof;

means to urge said rotatable member into an orientation relative to said member in which each said knife element of said rotatable member is spaced from the associated one of said feed paths, said urging means comprising a respective polygonal plate member connected to each said rotatable member and having a plurality of flat sides each in correspondence with a respective one of said knife elements on the associated one of said rotatable members, said urging means additionally comprising a



respective indexing member resiliently urged against the periphery of said polygonal plate member;

actuator means operatively associated with each said cutter means to cause the respective one of said cutter means to perform a single web cutting operation on each actuation by said associated actuator means, said actuating means comprising means to counteract said urging means thereby to cause said rotatable member to be rotatably displaced such that a respective single one of said knife elements co-operates with said second member to make an incision through said web, and interaction between said polygonal plate member, on being rotatably displaced, and said respective indexing member causing the latter to be displaced and permitting said respective indexing member to be resiliently urged against the next succeeding flat side of said polygonal plate member after each incision through said web has been made; and

control means to cause actuation of a selected one of said first and said second feeder means and to cause deactuation of the respective other one of said feeder means.

3,871,258

WOOD WORKING APPARATUS

James Hurn, Rowley, England, assignor to Hurn Brothers Engineering Limited, Bath, Somerset, England

Filed Feb. 5, 1974, Ser. No. 439,935

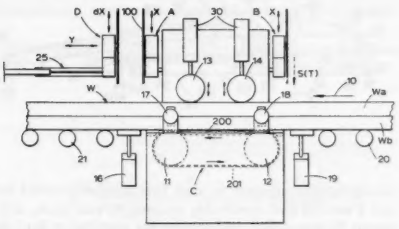
Claims priority, application United Kingdom, July 2, 1973, 6085/73; July 2, 1973, 6086/73

Int. Cl. B26d *5/20*

U.S. Cl. 83—255 **9 Claims**

1. Apparatus for cutting elongate timber workpieces accurately to length, which includes a conveying and clamping device comprising an endless conveyor belt running in toothed engagement over two spaced apart drive rollers which are driven in synchronism through a succession of rotary movements, each of predetermined amount, at least some of said amounts being different, the upper run of said belt being

substantially horizontal and being disposed above a fixed metal platen, a plurality of idler pressure rollers arranged at predetermined times and for predetermined durations to press downwardly towards said upper run of said belt where it passes over said platen, said conveying and clamping device being adapted and arranged to transport a workpiece resting



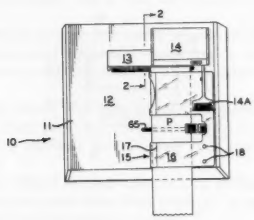
on the upper run of said belt irreversibly but intermittently in a single conveying direction from an infeed side to an outfeed side of the conveying and clamping device, and including at each of the infeed and outfeed sides of said conveying and clamping device a tool station which includes at least one cross-cut saw.

3,871,259

PAPER TRIMMER APPARATUS

Harry L. Hosterman, Akron, Ohio, assignor to Portage Newspaper Supply Co., Akron, Ohio

Filed Sept. 28, 1973, Ser. No. 401,852
Int. Cl. B23d *19/04*
U.S. Cl. 83—429 **7 Claims**



1. A paper trimmer apparatus, comprising, a table surface, a guide and feed roll, a pressure roll engaging said feed roller, a tension guide roller located rearwardly of said feed roller, a pinch roll mounted on a first shaft engaging said tension guide roll, said tension guide roll intermediate of the ends having a first cutting means for shearing, a second cutting means for shearing mounted on a second shaft, said second cutting means located juxtaposition to and bearing against said first cutting means of said tension guide roller.

3,871,260

APPARATUS FOR SELECTIVELY GUARDING A ROTARY BLADE

J. Samuel Rees, Rt. 1, Box 4, Preston, Ga. 31824

Division of Ser. No. 291,734, Sept. 25, 1972,. This application Oct. 5, 1973, Ser. No. 404,364
Int. Cl. B23d *33/00, 19/00*
U.S. Cl. 83—478 **3 Claims**

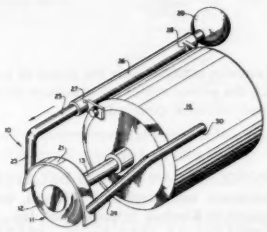
1. Apparatus for preventing unwanted contact with the peripheral edge of a rotary cutting blade mounted on a rotary shaft extending from a drive motor, comprising:

a blade guard member having a peripheral portion extending in spaced apart annular relation to at least part of the peripheral extent of the peripheral cutting edge;

support means connected to said blade guard member to maintain said blade guard member in predetermined relation with said cutting blade;

movement guide means mounting said support means for limited movement between a first position placing said peripheral portion of the blade guard member in spaced apart radial confronting position surrounding and preventing contact with said partial peripheral extent of the peripheral cutting edge, and a second position withdrawing said peripheral portion to a position axially spaced from the cutting blade and removed from said surrounding position;

said movement guide means comprises a guide passageway mounted alongside the drive motor;



said support means comprising a first support rod reciprocally received in said guide passageway and extending to a first end attached to said blade guard member and a second end located remotely of said blade guard member; knob means secured to said second end of said first support rod to impart reciprocal movement of said first support rod in said guide passageway;

a second support rod having a first end attached to said blade guard member and a portion extending alongside the drive motor for reciprocal movement in response to sliding movement imparted to said blade guard member by said first support rod; and

said first and second rod members being mounted for an extent of reciprocal movement necessary to move said blade guard member to either of said first and second positions.

3,871,261

METHOD OF TUNING AN ELECTRONIC KEYBOARD INSTRUMENT IN PURE SCALE AND APPARATUS THEREFOR

Ronald K. Wells, Spartanburg, and Charles W. Allen, Greenville, both of S.C., assignors to Ronald K. Wells, Spartensburg, S.C.

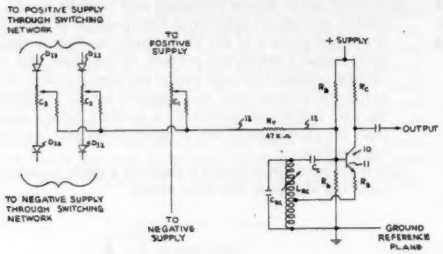
Filed Dec. 11, 1972, Ser. No. 314,016
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **6 Claims**

1. Apparatus for enabling an electronic keyboard instrument to play in various keys comprising:

a. a plurality of tone generators, said tone generators being electrically associated with digits across said keyboard, each generator being associated with only one digit per octave; and

b. a plurality of frequency modifier means associated with each tone generator, each said modifier means being adjustable according to predetermined intervals to cause the generator to emit a sound of a particular pitch, said modifier means being grouped according to a particular musical scale, and electronic switching means associated with said modifier means to activate certain modifier means only in each key, said switching means comprising a plurality of individual actuator means, each actuator means having an integrated circuit coupled thereto, said integrated circuits containing RTL NOR gates and power

switching transistors coupled thereto, each said power switching transistor being further coupled to one group of modifier means whereby actuation of one of said integrated circuits actuates only the group of modifier means to which the power switching transistor for said acutated integrated circuit is coupled.

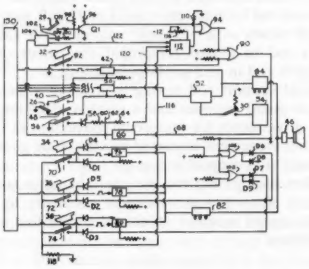


3,871,262

ELECTRONIC ORGAN HAVING DELAYED FILL IN

John W. Robinson, and Stephen L. Howell, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Dec. 14, 1973, Ser. No. 424,731
Int. Cl. G10h *1/00, 5/00*
U.S. Cl. 84—1.17 **26 Claims**



1. That method of operating an electronic organ in which at least one fill note sounds in the treble portion of a composition when a key of each of the solo and accompaniment keyboards of the organ are jointly depressed, said fill note comprising a note within an octave range below the note which corresponds to the depressed solo key and harmonically related to the notes corresponding to the depressed solo and accompaniment keys, said method comprising delaying the sounding of the said fill note for a predetermined and audibly discernable time interval after the sounding of the notes corresponding to the depressed keys.

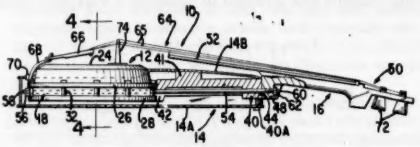
3,871,263

STRINGED MUSICAL INSTRUMENT

Donald W. Telesco, 39 W. Hill Rd., Stamford, Conn. 06902

Filed Apr. 1, 1974, Ser. No. 456,683
Int. Cl. G10d *3/00*
U.S. Cl. 84—271 **9 Claims**

9. A stringed musical instrument capable of easy disassembly comprising a generally circular drum, a sounding member circumscribing said drum, spacer means between said drum at a first circumferential location and extending toward the inner wall of said sounding member, said spacer means extending radially outwardly from said drum toward a neck which extends radially outwardly from said spacer means and relative thereto, rod means for removably securing said drum, said spacer means and said neck in assembled relation, said rod means extending through said spacer with a first end removably secured to said drum at a second circumferential location diametrically opposed to said first circumferential location and a second end removably secured to said neck, and string means having a first end removably secured to said drum at said second circumferential location and a second end secured to said second end of said neck.

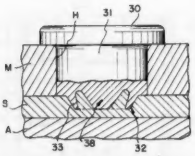


3,871,264

DRIVEN FASTENER FOR LIMITED PENETRATION OF METAL

Robert L. Hallock, 7136 N.E. 8th Dr., Boca Raton, Fla. 33432

Continuation-in-part of Ser. No. 172,381, Aug. 17, 1971, abandoned. This application Nov. 27, 1972, Ser. No. 309,851
Int. Cl. F16b *15/00*
U.S. Cl. 85—30 **6 Claims**

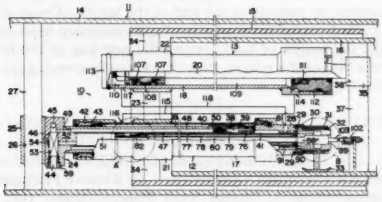


1. A fastener for limited penetration into metal comprising a smooth generally cylindrical shank with an enlarged head at one end and a rigid substantially non-deformable penetrating portion at the other end, said head being engageable by an impact force which is applied generally axially of said shank, said penetrating portion having a generally circumferentially continuous frusto-conical exterior wall tapering inwardly towards the axis of said shank in a direction away from the head and terminating in a penetrating end, said penetrating portion having a recess defined by an inner wall extending from said penetrating end to an abutment wall spaced axially inwardly therefrom, at least portions of said abutment wall extending laterally outwardly of the iinner periphery of said penetrating end, at least portions of said inner wall being inclined outwardly at an angle of substantially **10°** from said penetrating end to said portions of said abutment wall to provide significant undercut portions, and said penetrating portion being hardened so that it is harder than the metal into which it is to be driven, whereby when said fastener is driven substantially axially into metal by impact, the driving force causes said penetrating portion to penetrate the metal until the metal engages said abutment wall and is diverted outwardly into said undercut portions to secure the fastener to the metal and resist withdrawal of the fastener from the metal.

3,871,265
HYDRAULIC CYLINDER ASSEMBLY FOR TELESCOPIC BOOM

Ryosuke Koga, Hiromi and Kazuhiro Nonome, Dota, both of Gifu-ken, Japan, assignors to Kayabakogyokabushikikaisha, Tokyo, Japan

Filed Feb. 28, 1973, Ser. No. 336,785
Claims priority, application Japan, Mar. 2, 1972, 47-25883
Int. Cl. F15b *13/07*
U.S. Cl. 91—189 3 Claims



1. A hydraulic cylinder assembly for a telescopic boom of the type in which a plurality of telescopic boom members including a middle and an inner boom member are sequentially extended or retracted, comprising

a first and a second hydraulic cylinder unit, respectively coupled with said middle and said inner boom members and being mounted for movement between a fully upwardly extended and a fully downwardly retracted position;

a first passage provided in said first unit and having an inlet for pressurized hydraulic fluid, and a second passage connecting said first passage with an inlet of said second unit;

a normally closed first valve in said first passage and operative to open under the pressure of fluid entering through said inlet thereof, so that said first unit becomes extended;

a normally closed second valve in said second passage and operative to open when fluid pressure in said second unit exceeds a predetermined value;

a normally closed third valve in said inlet passage;

first abutment means operative to open a third valve in automatic response to said second unit reaching fully retracted position; and

second abutment means operative to open said second valve in automatic response to said first unit reaching fully extended position.

3,871,266
HYDRAULIC CYLINDER PHASING SYSTEM

Delmar G. Schwab, Milwaukee, and James I. Ott, Portland, both of Oreg., assignors to Hyster Company, Portland, Oreg.

Filed July 16, 1973, Ser. No. 379,754
Int. Cl. F15b *11/20*
U.S. Cl. 91—412 3 Claims

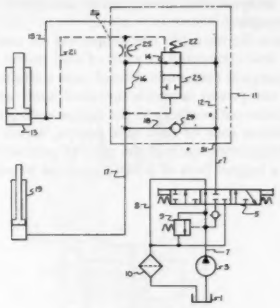
1. A hydraulic control system for regulating the extension and retraction of a plurality of hydraulic motors, said system comprising:

a first and second separate hydraulic motors;

a pump operatively connected to said motors;

said hydraulic control system including a hydraulic control circuit supplied with pressure fluid by said pump and including a pressure fluid reservoir;

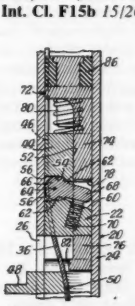
valve means within said circuit including means for sensing viscous flow losses and for sensing pressure loss within that portion of said circuit which supplies said first hydraulic motor; and means within said valve means reactive to said pressure loss and viscous flow loss to restrict pressure oil to said second hydraulic motor.



3,871,267
FLUID OPERATED PISTON AND CYLINDER MEANS

Kenneth J. Miller, Gurnee, Ill., assignor to A. L. Hansen Mfg. Co., Gurnee, Ill.

Filed Jan. 18, 1974, Ser. No. 434,650
Int. Cl. F15b *15/26*
U.S. Cl. 92—24 4 Claims



1. For use in a cylinder, a fluid actuated piston assembly comprising a primary piston section, at least one transverse clutch member pivotally mounted in said primary piston section and being engageable with the cylinder wall, spring means interposed between said primary piston section and one side of said clutch member and normally acting to pivot the latter into wedging engagement with the cylinder wall whereby to prevent travel of said piston assembly in the cylinder in one direction, and a secondary piston section engageable with the other side of said clutch member for pivoting the same out of wedging engagement with the cylinder wall against the force of said spring means when actuating fluid pressure in the cylinder moves said secondary piston section relative to said primary piston section whereby to permit travel of said piston assembly in the cylinder in said one direction.

3,871,268
COMBINATION PUMPING APPARATUS

Yusi Misima, Tokyo, Japan, assignor to Shimazaki Mixing Equipment Co., Ltd., Tokyo, Japan

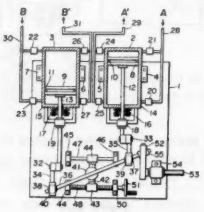
Filed July 16, 1973, Ser. No. 379,561
Claims priority, application Japan, Dec. 30, 1972, 48-000139; Feb. 5, 1973, 48-014431
Int. Cl. F15b *15/24*
U.S. Cl. 92—13.3 6 Claims

1. In a combination pumping apparatus including:

I. at least two unit pumps each including a piston rod fixedly arranged parallel with one another to a base;

II. a supporting point shiftable perpendicularly with respect to the reciprocation directions of said piston rods of said unit pumps;

III. a conically movable rod supported on said supporting point, and connected to each of said piston rods of said unit pumps at each ends thereof; said shiftable supporting point comprising a screw-threaded shaft arranged perpendicular with respect to the reciprocating directions of said piston rods of said unit pumps, a pair of bearings each supporting each of the ends of said screw-threaded shaft, a tapped boss of a hemispherical bearing engaging



with said screw-threaded shaft, and a spherical bush supported on said hemispherical bearing; the strokes of said rods of said unit pumps being varied according to the shift of said support point caused by rotating said screw-threaded shaft the improvement characterized in that a disc-shaped crank arm is mounted on one end of an input shaft supported by a bearing secured to said base, and another crank arm is mounted so as to be opposite to said disc-shaped crank arm on a supporting shaft supported by a bearing which is oppositely disposed to said base bearing at a given interval therebetween, and each of said crank arms is connected to a respective end of said conically movable rod.

3,871,269
BAG SEVERING MACHINE

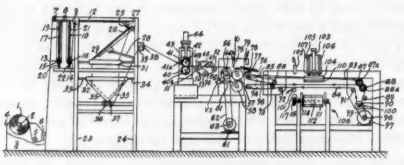
Elwyn David Jones, Beloeil, and Derek Edgar Scuffell, Brownsburg both of Quebec, Canada, assignors to Canadian Industries Limited, Montreal, Canada

Division of Ser. No. 207,306, Dec. 13, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,937

Claims priority, application Canada, Sept. 13, 1973, 181033; Dec. 22, 1970, 101336

Int. Cl. B31b *21/00, 1/14*

U.S. Cl. 93—13 **5 Claims**



1. A machine for concurrently severing individual bags from a length of bags joined by perforated junctures and folding the severed bags comprising first and second sets of double coacting rollers, each set of rollers being adapted to grasp the length of bags between the two rollers of the set, and positioned intermediate said first and second sets of rollers a support means comprising a lower endless conveyor belt and in contact therewith a cooperating upper endless conveyor belt, said cooperating conveyor belts being adapted to support the length of bags between their contacting surfaces as it passes from the first set of rollers to the second set of rollers, and means for driving the two sets of rollers and intermediate conveyor belts so that the surface speed of the second set of rollers is greater than the speed of the conveyor belts and the speed of the conveyor belts is greater than the surface speed of the first set of rollers, thus extending the length of bags as it passes from the first set of rollers to the second set of rollers so as to sever the individual bags at the perforated junctures, wherein the conveyor belts and second set of rollers are positioned so that the end of the length of bags issues from between the conveyor belts and passes over the bite of the second set of rollers, and there is provided a nozzle directed into the bite of the second set of rollers, said nozzle being adapted in response to passage of the end of the length of bags across the second set of rollers to send a momentary blast of air against the length of bags forcing the end bag of the length into the bite of the rollers, thus concurrently severing the bag and folding it.

3,871,270
BAG-MAKING MACHINERY

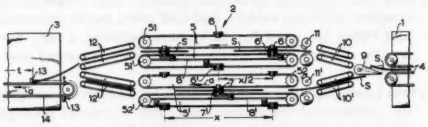
Gustav Kuckhermann, Goethestrasse 24; Richard Feldkamper, Wielandstrasse 5; Walter Paul, Bahnhofstrasse 101, and Friedrich Franz Brockmuller, Diersmannsweg 54, all of 454 Lengerich i, Westphalia, Germany

Filed Sept. 6, 1973, Ser. No. 394,816

Claims priority, application Germany, Sept. 11, 1972, 2244561

Int. Cl. B31b *1/08*

U.S. Cl. 93—27 **3 Claims**



1. An apparatus for making bags with cross-bottom folds comprising a tube-forming means for making tube sections having at least one ply from flat sheet material selected from the group consisting of paper and plastic film and discharging the tube sections longitudinally, rotating means positioned downstream of the tube-forming means for rotating the discharged tube sections 90° while maintaining the tube sections in substantially the same plane, said rotation positioning the tube sections for subsequent feeding in a direction transversely of their length, and folding means including a conveyor positioned downstream of the rotating means for forming said cross-bottom folds at at least one end of each of the transversely-fed tube sections, said rotating means including a jaw rotator comprising two superposed rotating devices, deflecting means positioned upstream of said rotating devices for directing the tube sections alternately to each device, and a pair of conveyors positioned downstream of the devices for transferring the transversely-fed tube sections in a row onto the conveyor of said folding means.

3,871,271
METHOD OF MANUFACTURING COMPACTER BAGS

Donald V. Long, Dallas, Tex., assignor to The Dalpak Corporation, Dallas, Tex.

Division of Ser. No. 226,087, Feb. 14, 1972, Pat. No. 3,822,037. This application Feb. 25, 1974, Ser. No. 445,255

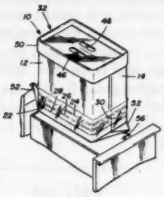
Int. Cl. B31b *39/60*

U.S. Cl. 93—35 VL **11 Claims**

1. A method of making compactor bags including the steps of:

joining a pair of sheets along opposed edges and at one end to form a bag having a predetermined length;

forming a liquid impervious casing having a length less than that of the bag; and



securing the liquid impervious casing around the outside of the joined sheets with the casing surrounding said one end.

3,871,272

INTENSIVE WINE-MAKING PROCESS AND THE RELATIVE PLANT FOR CARRYING IT OUT

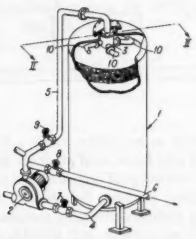
Rino Melandri, Lugo, Italy, assignor to Diemme S.N.C., Lugo, Italy

Filed Nov. 6, 1972, Ser. No. 303,924

Claims priority, application Italy, Nov. 30, 1971, 46927; Italy, July 27, 1972, 46899

Int. Cl. C12b *1/02;* **C12g** *1/06*

U.S. Cl. 99—276 **7 Claims**



1. A wine-making plant comprising at least one vat, a torque flow pump connected to a feed pipe leading to said vat; a sprayer with discrete arms, rotating by reaction, situated in the top part of the vat and comprising a plurality of L shaped tubes of various lengths connected, by means of a locating flange to a central cylindrical body, an upper closing flange carried by said body which rotatably rests on a centering and thrust bearing carried by said feed pipe; a further ring of elastic material situated in the lower zone of contact between the cylindrical body and the end of the feed pipe; a suction pipe, provided with a valve which connects the base of the vat to the pump inlet; and a pipe provided with a valve which connects the pump outlet to the inlet of a trickle pressing plant.

3,871,273

BEVERAGE MAKING APPARATUS

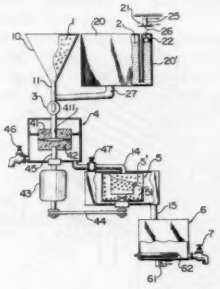
Chin-Yuan Hsieh, No. 35, Hsia Tan De, Pei Lei, Chia I, Taiwan, China

Filed Aug. 14, 1973, Ser. No. 388,277

Int. Cl. A47j *31/42*

U.S. Cl. 99—286 **10 Claims**

1. Apparatus for making a beverage in a single operation comprising a solid food feeding means, a liquid feeding means, a grinding means arranged in sequence with a separating means and a heating means, an electric motor connected to drive said grinding means and said separating means, means for supplying a mixture of solid and liquid food from said feeding means into said grinding means, means for conveying the resultant slurry from the grinding means to the separating means where the beverage is extracted, means for conveying the extracted beverage into said heating means, an electrical circuit containing said motor and an actuator for said mixture supply, and control means in said circuit responsive to the presence of a predetermined amount of liquid in said liquid feeding means for energizing said motor and operating said



actuator to supply the mixture to the grinding means, said control means being further responsive in the absence of a predetermined amount of liquid in the liquid feeding means to deenergize said motor and operate said actuator to arrest supply of said mixture.

3,871,274

FILLING CAKES

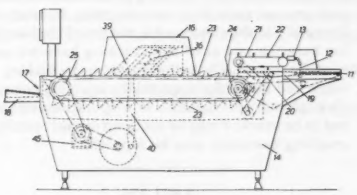
John Alfred Hornby, Cambridge, England, assignor to John (Huntingdon) Limited, Huntingdon, England

Filed Sept. 7, 1973, Ser. No. 395,190

Claims priority, application United Kingdom, July 23, 1973, 34990/73

Int. Cl. A21c *9/06*

U.S. Cl. 99—450.8 **11 Claims**



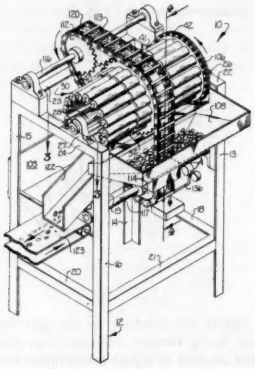
1. Apparatus for injecting filling material into cakes, such as doughnuts, which apparatus comprises a conveyor comprising a plurality of cake holders arranged to convey successive transverse rows of cakes along a horizontal conveying path, the cake holders providing a plurality of cake positions side by side in each transverse row so that a plurality of cakes are conveyed along parallel paths, filling means located adjacent the conveyor and including a plurality of injecting nozzles extending across the conveying path with at least one nozzle adjacent each cake position, means for tilting the cake holders when adjacent the filling means so that the base of each cake in the row adjacent the filling means is inclined to the horizontal and thereby exposes an edge region of the cake, and means for effecting relative reciprocating movement between the injection nozzles and the row of cakes adjacent the filling means to inject the nozzles into the exposed edge regions of the cakes, whereby filling materials may be injected into the cakes, and then withdraw the nozzles from the cakes.

3,871,275

HIGH PRODUCTION NUTCRACKING APPARATUS

James Bland Quantz, 3912 Kenilworth Rd., Columbia, S.C. 29205

Filed May 29, 1973, Ser. No. 365,039
Int. Cl. A23n 5/02
U.S. Cl. 99—571 30 Claims



1. A high production nutcracking apparatus comprising

a tubular member including a centrally located opening adapted to receive a nut therein,

an anvil positioned within said tubular member adjacent one side of said opening,

a cracking hammer mounted within said tubular member adjacent the other side of said opening for limited axial movement forwardly toward said opening and rearwardly away from said opening,

port means communicating with said tubular member rearwardly of said cracking hammer,

means for sequentially injecting pressurized air through said port means such that said cracking hammer is thrust forwardly to thereby crack a nut positioned in said opening between said anvil and cracking hammer, and

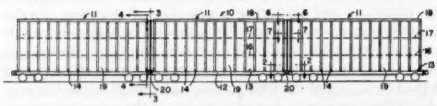
means for rearwardly withdrawing said cracking hammer when said means for sequentially injecting pressurized air through said port means is non-operative and such that a nut to be cracked may be received in said opening and the cracking operation may be repeated.

3,871,276

CONNECTION DIAPHRAGMS BETWEEN ARTICULATED CARS

John W. Allen, Flossmoor, Ill., assignor to Stanray Corporation, Chicago, Ill.

Filed Aug. 17, 1973, Ser. No. 389,339
Int. Cl. B61d 17/20
U.S. Cl. 105—8 R 4 Claims



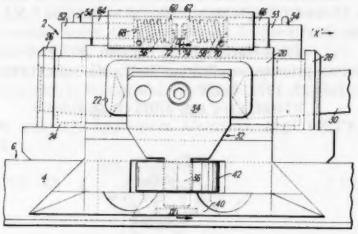
1. A railway vehicle comprising a pair of connected car sections, said sections each having a floor and a roof, connecting means for spanning the space between said sections, said connecting means comprising rectangular frames mounted on the adjacent ends of said sections, pivot pin means located intermediate the sides of said respective car sections on the longitudinal axes thereof, means mounting said rectangular frames for free turning movement about the longitudinal axes of said vehicle sections, slot means in said frames accommodating said pivot pin means for permitting lengthwise movement of said frames relative to said pivot means, and biasing means mounted on said respective sections engageable with the sides of said rectangular frames for normally positioning said frames in end-to-end relationship and permitting said frames to telescope and pivot relative to each other and to an associated section.

3,871,277

TRACKED WALKING GEAR

Robert Benjamin Bolton, 14 Middle Dr., Northumberland, England

Filed Feb. 25, 1974, Ser. No. 445,477
Int. Cl. B61c 13/00
U.S. Cl. 105—31 7 Claims



1. For a machine to be driven along a track or rail having a pair of opposed side faces, said machine including a reciprocable drive rod, walking gear comprising a holding mechanism including a trapping member for slidably engaging a rail or track, a jamming member pivotally mounted on the trapping member, a receiving portion and, slidably mounted in, to be movable relative to, said receiving portion, a shuttle member adapted to be connected to the drive rod of the machine, a pin member being dependent from said shuttle member and cooperating with the jamming member in such a manner that, in use, movement of the drive rod in one direction results in movement of said pin in one direction to pivot the jamming member from its rest position in which it is out of pressurized contact with the rail or track into an operative position forcing it onto the rail or track, whereby the rail or track is gripped between a trapping surface of the trapping member and the jamming member, the holding mechanism thereby being locked in position relative to said rail or track, subsequent movement of the drive rod in the other direction resulting in movement of said pin in the other direction to pivot the jamming member back towards its rest position to release said member from the rail or track so that the holding mechanism is free to slide along said rail or track.

3,871,278

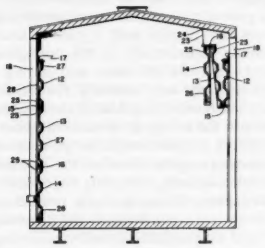
RAILROAD GRAIN DOOR

Kent P. Shoemaker, 4914 Arden, Edina, Minn. 55434

Filed Oct. 31, 1973, Ser. No. 411,312
Int. Cl. B61d 19/00; B60j 5/06
U.S. Cl. 105—378 10 Claims

10. In combination a railroad box car having side opening doorways and a grain door, said grain door comprising a plurality of panel members of a leength to span said doorways, said panels being consecutively joined by hinge means intermediate adjacent panels at the long edges of said panels to form a panel assembly, the total width of said panels being the major portion of the height of said doorway, means joining the remote ends of the topmost panel to inner side of the door-

posts of said doorway below the top of said opening so that the balance of said panels are supported in position adjacent said doorposts solely from said top panel with the lowermost panel



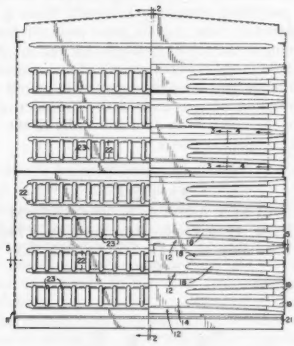
in contact with the floor of said box car, the bottom panel of said panel assembly including movable cover means for exposing said openings.

3,871,279

BOX CAR END AND LINER

John W. Allen, 1241 Douglas, Flossmoor, Ill. 60422

Continuation-in-part of Ser. No. 249,100, May 1, 1972, abandoned. This application June 18, 1973, Ser. No. 371,034
Int. Cl. B61d *17/06*
U.S. Cl. 105—410 **15 Claims**



1. A railway vehicle end comprising a liner sheet terminating along each of the side edges in flanges projecting at a substantially right angle to the plane of said sheet, a plurality of horizontal stiffeners welded to said sheet, said stiffeners being of substantially hat shaped cross section and tapering toward each of the side edges so that the ends of said stiffeners are substantially flat and are bent in face-to-face overlying relation to said right angular flange of said liner sheet.

3,871,280

GLUE APPLYING ASSEMBLY FOR MULTIPLE WEB-FED PAPER HANDLING APPARATUS

Donald A. Glaser, Emporia, Kans., assignor to Didde-Glaser, Inc., Emporia, Kans.

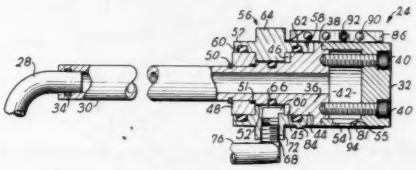
Filed Sept. 7, 1973, Ser. No. 395,136
Int. Cl. B05c *5/02*
U.S. Cl. 118—412 **5 Claims**

1. An applicator adapted to be interconnected to a supply of fluid substance for applying a strip of the latter to a moving web, said applicator comprising:

an elongated applicator head adapted to be positioned proximal to said web and having a forward fluid substance applying section adjacent said web and a rearward section presenting a bearing surface,

said forward section including a hollow chamber defined in part by a wall having an orifice therethrough of relatively small diameter for the application of said fluid substance; slidable means positioned on said bearing surface and axially shiftable therealong;

relatively thin, apertured means in covering disposition to said fluid substance applying section and axially shiftable between a first operative position wherein said aperture is registered with said orifice, and a second flow-



preventing position where said orifice is covered to preclude fluid flow therefrom;

means coupling said apertured means and slidable means for axial movement thereof in unision, said coupling means precluding significant rotational movement of the apertured means relative to said forward section; and

means for selectively shifting said slidable means, including:

first fluid pressure means coupled to said slidable means for axially shifting said apertured means to said first position when fluid pressure is applied thereto; and

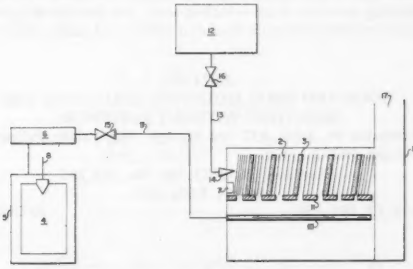
second fluid pressure means coupled to said slidable means for axially shifting said apertured means to said second position when fluid pressure is applied thereto.

3,871,281

USE OF THE CHLORATE CANDLE AS A SOURCE OF OXYGEN FOR THE EMERGENCY DESTRUCTION OF CLASSIFIED MATERIAL

Joseph T. Leonard, Falls Church, and Donald E. Field, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 24, 1973, Ser. No. 391,408
Int. Cl. E05g *3/00*
U.S. Cl. 109—29 **2 Claims**



1. A system for destruction of combustable materials comprising:

a container for enclosing said materials;

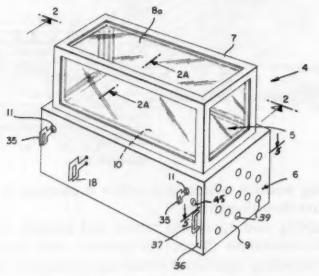
means disposed within said container for igniting said materials;

at least one chlorate candle disposed external and proximate to said container;

means for enclosing said candle;

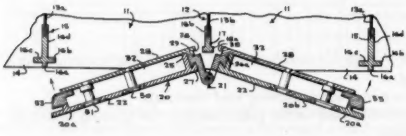
means for igniting said candle;
conduit means joining said enclosure means and said container for introducing into said container oxygen generated by said chlorate candle, said conduit means disposed so as to release oxygen below said material.

3,871,282
METHOD AND DEVICE FOR ANTI-THEFT SECURING OF A SPACE
Morton Jessup Rose, 61-15 98th St., New York, N.Y. 11374
Filed Apr. 23, 1973, Ser. No. 353,526
Int. Cl. F05g *3/00*
U.S. Cl. 109—31 **14 Claims**



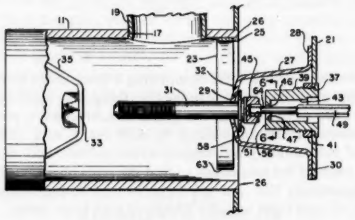
1. A display security-space device for deterring entry into a security exhibiting display space by unauthorized personnel, comprising in combination: a structure including at least in part a double-walled enclosable vessel having double walls of spaced-apart substantially parallel transparent panels enclosing a confined display security space defined by an inner one of the panels of the double walls of the double-walled enclosable vessel, the spaced-apart parallel transparent panels defining therebetween a jacket-space, said structure circumscribing said jacket-space such that said jacket-space is totally enclosable and pressurizable of gas therewithin, locking means for alternately providing for and denying access to said jacket-space from an outer exterior of the structure and the jacket-space thereof, said structure further defining a gas-enclosing metal encasing-structure defining free-space within and defining vents therefrom in communication with said jacket-space and an outlet valve means for releasing gas from the gas-enclosing metal encasing-structure, there being gas of predetermined high pressure within the gas-enclosing metal encasing-structure, and access closable-opening means for access into each of said security space and said free-space when said locking means is in an unlocked state, and pressurized gas of predetermined pressure enclosed within said jacket-space.

3,871,283
DOOR AND DOOR MOUNTING STRUCTURE FOR MOUNTING WITHOUT FASTENERS
Frederick W. John, 837 3rd St. Apt. 302, Pacific Palisades, Calif. 90272
Filed July 31, 1973, Ser. No. 384,202
Int. Cl. E05g *1/00*
U.S. Cl. 109—56 **10 Claims**



1. A door and door mounting construction for safe deposit box installations for mounting companion pairs of hinged doors in respective pairs of laterally alined safe deposit storage compartments flanking a vertical divider wall between them, comprising wall means including said divider wall defining frames surrounding said compartments defining a pair of access openings to each pair of compartments, said divider wall having a pair of tongue formations projecting oppositely outwardly from said divider wall, a pair of laterally spaced doors conforming substantially to the configuration of the access openings to close the same and having confronting adjacent edge portions and mutually remote free edges, a hinge structure interconnecting said adjacent edge portions of the pair of doors for swinging movement about a common hinge axis between a closed coplanar position and an open outwardly diverging angular position, the adjacent edge portions of said doors defining mounting edges having confronting groove formations facing inwardly toward said common plane and collectively conforming to the cross-sectional configuration of said tongue formations for receiving the tongue formations therein when said doors are swung to said closed position with said mounting edges embracing said tongue formations for coupling the doors to the support member, means at the free edges of the doors for releasably restraining each door in closed position in its access opening to coact with the groove formation of such closed door and the associated tongue formation received therein in supporting the companion door hinged thereto when such companion door is swung to open position, the mounting edges of each of said doors also having a groove of dovetail horizontal cross section substantially spanning the height of the associated door opening through the top or bottom edge of the door and opening through said mounting edges in confronting relation to the groove of the companion door, said hinge structure comprising a pair of vertically spaced hinge knuckle formations for each door projecting forwardly integrally from a vertically elongated dovetail cross section base inserted through the groove opening in the top or bottom edge and interfitted and frictionally held in the dovetail groove of the associated door, and vertical hinge pins coupling together in paired relation a knuckle formation of one door with a respective knuckle formation of the companion door forwardly of the front surfaces of the companion doors.

3,871,284
COIN BOX AND LOCK MECHANISM
George W. Krise, 1770 Trolley Rd., York, Pa. 17404
Filed July 30, 1973, Ser. No. 383,703
Int. Cl. E05g *1/04*
U.S. Cl. 109—59 **5 Claims**



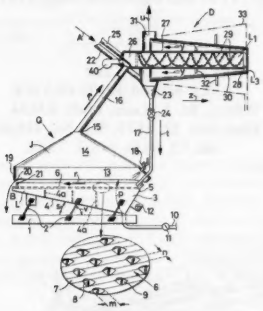
1. A coin box construction comprising a cylinder having a closed and an open end, a circular cover snugly receivable in said open end, stop means within said cylinder and positioning said cover in flush relation with the adjacent end surface of said cylinder, a bolt operatively engageable with said cover and spaced inwardly therefrom and threadedly receivable in nut means fixed to said cylinder, said bolt having a wrench receiving head, said cover having an aperture in general alignment with said bolt and permitting access to said wrench receiving head by a wrench from outside said cover, means on said cover adjacent said aperture forming an obstruction to

free removal of said bolt through said aperture, lock means including a body fixed to said cover and a portion removably securable thereto and covering said bolt, said bolt head having a portion engaging said obstruction when said bolt is being unthreaded from said nut means and serving to jack said cover out of said cylinder.

3,871,285
INCINERATOR DEVICE AND A METHOD OF PROCESSING RESIDUALS IN WASTE WATER, LIQUEFIED SEWAGE AND SLUDGE

Wendel Bastgen, Betzdorf near Siegen, Germany, assignor to Albert Klein KG, Nieder-Fishbach, Germany

Filed Oct. 19, 1973, Ser. No. 408,116
Claims priority, application Germany, Oct. 19, 1972, 2251211; June 9, 1973, 2329626
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 R **31 Claims**



1. A device for incinerating granulated combustible material, said device comprising in combination:

at least one sieve-type grate for feeding combustible material thereupon, said grate being in the form of a rigid plate-shaped member having spaced apart perforations, the peripheral outline of each of said perforations being small in relation to the total area of said plate-shaped member;

support means mounting said grate for imparting swinging movements to the same, said support means including a generally trough-shaped structure disposed underneath said grate and mounting the same;

at least one swingable member supporting said structure for imparting swinging movements to the structure and the grate;

exciter means coupled to said swingable member for imparting swinging movements to the same; and

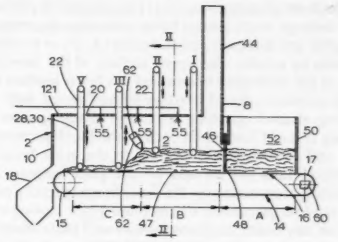
air supply means connected to the trough-shaped structure for continuously feeding air into said structure to form an air cushion therein thereby continuously cooling the grate.

21. A method of processing residuals in waste water, sewage or sludge, said method comprising the steps of providing an incinerator installation including at least one sieve-type grate in the form of a perforated plate and supply means for continuously feeding air to the grate from below thereby cooling the same, preliminarily drying the residuals by appling pressure thereto, granulating the predried residuals, continuously maintaining a bed of hot air above said grate, then continuously guiding the granulate in the form of a layer along said hot air bed, and imparting swinging movements to said layer causing the granulate to dip intermittently into the hot air bed as it passes over the same.

3,871,286
INCINERATOR

Norolf Henriksen, Rugdeveien 9, 3670, Notodden, Norway

Filed Jan. 15, 1973, Ser. No. 323,711
Int. Cl. F23g *5/04*
U.S. Cl. 110—8 R **3 Claims**



1. An incinerator for burning refuse, garbage and the like material, said incinerator comprising:

a furnace having end walls, side walls and a ceiling;

a fire grate conveyor means extending horizontally within said furnace for moving material to be burned from one end wall of said furnace to the other end wall thereof;

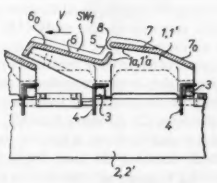
said side walls, end walls, ceiling and fire grate conveyor means defining a furnace chamber;

at least one air blower unit means mounted within said furnace chamber for blowing combustion air against said material to be burned when positioned on said fire grate conveyor means, each of said blower unit means including perforated blower heads and mounting means extending across said furnace chamber in a direction transverse to the direction of movement of said fire grate conveyor means for providing pivotal movement of each of said blower unit means about an axis extending in said transverse direction.

3,871,287
COMBUSTION GRATE STRUCTURE

Kurt Spillman, Stafa, and Georg Von Arx, Kloten, both of Switzerland, assignors to Von Roll AG, Gerlafingen, Switzerland

Filed Dec. 14, 1972, Ser. No. 314,915
Claims priority, application Switzerland, Dec. 22, 1971, 18731/71
Int. Cl. F23g *3/00*
U.S. Cl. 110—8 R **9 Claims**



1. In a combustion grate structure having spaced grate plates (**6, 7**) on which the substance to be burned is adapted to be positioned, grate beams (**2, 2'**) located beneath the grate plates, grate support blocks located between the grate beams and the grate plates (**6, 7**) to removably support the grate plates on the beams and space the plates from the beams;

means supporting said grate beams;

selected grate beams (**2'** - FIG. **4**) being movable along the direction of feed of said substance and other grate beams

(2 - FIG. 3) being stationary on said support means, said movable (2') and stationary (2) beams being located adjacent each other,

the improvement wherein

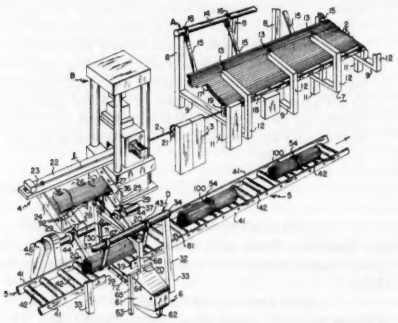
the grate plates (1*a*, 1'*a*; 6, 7) and the support blocks on the movable as well as on the stationary beams are identical, single, integral castings (1, 1') so that the plates and the blocks form plate portions (1*a*, 1'*a*) and block portions of said castings, said castings being placed on the respective movable and stationary grate beams (2, 2') to be retained thereon by gravity, the upper surface of the movable as well as the stationary beams and the lower surface of the block portions of said castings being formed with interlocking, shaped matching seats, said matching seats comprising ribs (3) formed on each of the block sections (1*a*, 1'*a*) and extending transversely to the grate beam, and abutment rails (4) formed on the grate beams (2, 2') extending transversely to the grate beams thereby permitting random placement of any plate-block casting on any seat on any beam, and retention of said plate-block castings on the beam, by gravity and by the interlocking seat.

3,871,288

AUTOMATIC BAR HANDLING SYSTEM

Frank F. White, Mentor, Ohio, assignor to Automation Development Corporation, Mentor, Ohio

Filed Nov. 23, 1973, Ser. No. 418,279
Int. Cl. B65b *13/04*
U.S. Cl. 100—2 **24 Claims**



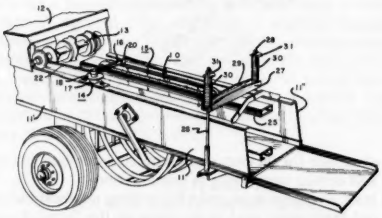
1. A process for handling long hollow or solid bars (2) comprising supporting a bundle of said bars on spaced slings (15) of a bundle unscrambler (A), causing said slings (15) to move over longitudinally-aligned sling supports (17) located near the end of a storage ramp inclined downwardly from said sling supports while supporting the ends (16) of the slings remote from said storage ramp at an elevation greater than that of said sling supports to provide festoons extending under the bundle to support the same, repeatedly raising the bars and slings by moving the slings up over said sling supports (17) to cause some of the bars (2) to move laterally over the sling supports to said ramp and to form a row of parallel bars on said ramp, repeatedly feeding the bars from the ramp to a conveying means (18,19) generally parallel to the bars in said row, repeatedly causing each bar on said conveying means to move to a metalworking machine (B) which acts on the bar, continually discharging bars from said machine to a downwardly inclined discharge ramp (4), supporting the bars (*b*) discharged from said ramp on spaced slings (20) of a bundle banding apparatus (D), causing said last-named slings to move over longitudinally aligned sling supports (44) located near the end of said discharge ramp (4) while supporting the ends (43) of the slings remote from said discharge ramp to provide festoons extending under the bars (*b*) to support the same, transferring a small number of bars (*b*) from said discharge ramp (4) to said last-named slings (20) while the slings are in elevated positions, gradually lowering the slings (20) while transferring more bars (*b*) to the slings to form a bundle supported on the slings, providing a strapping machine (6) with a strapping head (61) and a strap guide (70) extending around the bundle, said strap guide having an open portion to permit lateral feed of the bars (*b*) from said discharge ramp (4) to said bundle and having guide means (76,77, 78*a*,78*b*) to direct a strapping tape (54) from said head (61) around the bundle and back to said head, whereby said head (61) can tighten the tape (54) around the bundle (100) and thereafter sever the tape to complete one cycle, counting the number of bars discharged from the ramp (4) to the slings (20), stopping the movement of bars from the ramp (4) to the bundle when a predetermined number of bars have been accumulated in the bundle, causing operation of the strapping machine while such movement is stopped and while the bars are forced together on the slings to form a strapped bundle (100) while bars continue to be fed to said discharge ramp, removing the strapped bundle (100) from said slings, raising the slings (20) and thereafter restarting the feed of bars (*b*) from said discharge ramp (4) to said last-named slings (20) to repeat the cycle.

3,871,289

BALE MEASURING DEVICE

George W. Wilhite, Rt. 1, Kuna, Idaho 83634

Filed Nov. 23, 1973, Ser. No. 418,481
Int. Cl. B65b *13/02, 13/06*
U.S. Cl. 100—4 **2 Claims**



1. In combination with a commonly known baler having a bale cutoff mechanism and a discharge chute, a bale measuring device, comprising:

an actuator assembly having a cam arm disposed horizontally substantially transversely of the uppermost terminal edge of said discharge chute on a mounting plate bearing at the uppermost edge of one sidewall of said chute, a web being fastened to said bearing and pivotly to a connecting link on a eccentrically disposed pivot, said connecting link being mechanically associated with said cutoff mechanism, said cam arm including urging means to return said cam arm to a substantially transverse position and said actuator arm to a position wherein the connecting link is in its feed position; and

a metering chain mounted on a carrying arm which is disposed rectilinearly in said discharge chute wherein said carrier arm is pivotly mounted on an axle which is fastened transversely to the uppermost terminal edge of said chute distally forward of said actuator assembly, and being mounted on a floating bracket at the end opposite axle to permit said meter chain to follow the uppermost terminal side of a bale regardless of variations in said bale, a pair of sprockets suitably journally mounted in said carrier arm, a roller chain disposed about said sprockets in circuit metering studs which project at predetermined intervals from said roller chain to cam said cam arm.

3,871,290

METHOD FOR TREATING PAPER

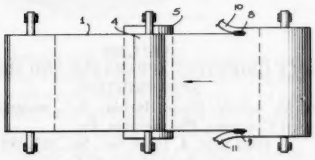
Hermann Verboom, Hagelkreuz, Germany, assignor to Eduard Kuesters Maschinenfabrik, Krefeld, Germany

Filed Dec. 1, 1971, Ser. No. 203,695

Claims priority, application Germany, Dec. 3, 1970, 2059533

Int. Cl. B30b *13/00, 3/00, 3/04*

U.S. Cl. 100—39 6 Claims



1. A method of pressure treating a paper web between a pair of rolls positioned adjacent one another, at least one of which has a work-engaging surface of plastic material, comprising the step of passing a paper web of a width no less than the width of the plastic-surfaced roll between the pair of rolls, whereby the paper web prevents any direct contact between the plasticsurfaced roll and the other roll of the pair of rolls.

3,871,291

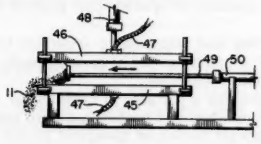
APPARATUS FOR PROCESSING GARBAGE

Rush E. Lassiter, Hammond, La., assignor to Floyd Rush Corporation, Baton Rouge, La.

Division of Ser. No. 213,378, Dec. 29, 1971, abandoned. This application Apr. 6, 1973, Ser. No. 348,616

Int. Cl. B02c *11/08;* B30b *9/00, 13/00*

U.S. Cl. 100—93 P 19 Claims



1. An apparatus for drying and compressing garbage, comprising:

lower hot platen means,

upper hot platen means, means for moving said upper and lower hot platen means toward and away from one another,

feed means for placing garbage on said lower hot platen, and

scraper means for scraping garbage from said lower hot plate means and said upper hot platen means.

3,871,292

PLATEN PRESS STRUCTURE

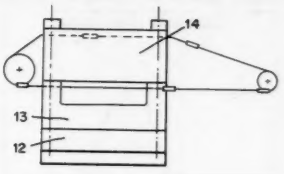
Edwin Bolliger, Morges, Switzerland, assignor to J. Bobst & Fils S.A., Switzerland

Filed Mar. 6, 1973, Ser. No. 338,634

Claims priority, application Switzerland, Mar. 7, 1972, 3344/72

Int. Cl. B21j *13/04;* B30b *15/30*

U.S. Cl. 100—215 6 Claims



1. A platen press having a support member, an upper platen, a pair of cross pieces, said cross pieces being placed on opposite sides of said upper platen between the upper platen and said support member, and means tightly urging said cross pieces against the upper platen to pre-stress the upper platen.

3,871,293

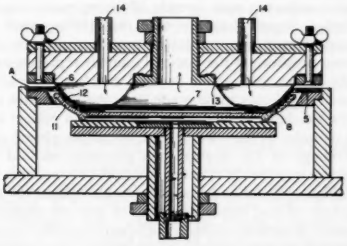
APPARATUS FOR PRINTING ON CERAMIC TABLEWARE

Jose Valiela, New York, N.Y., assignor to Interpace Corporation, Parsippany, N.J.

Division of Ser. No. 255,738, May 22, 1972, Pat. No. 3,756,165, which is a continuation-in-part of Ser. No. 43,044, June 3, 1970, abandoned. This application Mar. 21, 1973, Ser. No. 343,374

Int. Cl. B41f *17/00*

U.S. Cl. 101—41 2 Claims



1. apparatus for applying a decorative colorant to an item of ceramic tableware including in combination:

a rigid flat base ring having a central opening,

an elastic open-mesh net secured to the ring and covering the opening,

the net provided with a transfer member having a total release transfer surface thereon within the area of the central opening of the base ring,

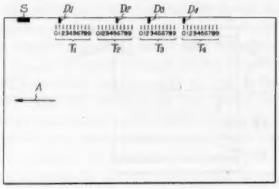
colorant printed on at least one area of the transfer surface, the net being displaceable out and returnable to the plane of the base ring whereby to permit the colorant on the transfer surface to be moved into contact with the tableware and printed thereon,

a gas inflatable and vacuum deflatable balloon operable against the net for displacing same in a direction to move the transfer surface into the quickly out of contact with the tableware.

3,871,294
DUPLICATOR MASTER FEED USING DECIMAL CODE TO SET COPY COUNT

Yoshiharu Kagari, and Koichi Hirokawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Continuation-in-part of Ser. No. 882,648, Dec. 5, 1969, abandoned. This application July 10, 1972, Ser. No. 270,561
Claims priority, application Japan, Dec. 30, 1968, 43-96546
Int. Cl. B41l *11/08, 11/14*
U.S. Cl. 101—132.5 **3 Claims**

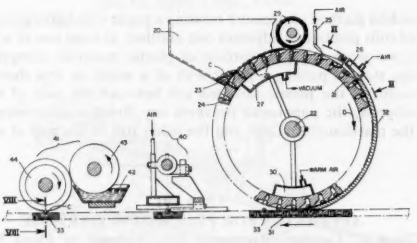


1. An automatic duplicating machine, of the offset lithographic type, using substantially rectangular masters having a leading edge and a trailing edge interconnected by a pair of longitudinal side edges, said machine comprising, in combination, a master cylinder having gripping means operable to grip the leading edge of a master fed thereto; an automatic master feed device operable, responsive to actuation of a start control, to initiate feeding of a master to said master cylinder; the masters fed by said automatic master feed device having impressed thereon markings indicating the respective number of duplicates to be made from each master; the markings impressed on each master including a first row of timing marks extending longitudinally of one of said side edges thereof and impressed on the master in separated decades with each decade representing a respective column position of a multicolumn decimal number, and each timing mark in each of said decades representing a respective decimal digit from 0 to 9; and a second row of longitudinally spaced data marks extending parallel to and spaced laterally from said first row and including one respective single said data mark impressed on the master adjacent each decade of timing marks; each data mark being aligned laterally with that timing mark, of its associated decade, representing the respective decimal digit, in column position, of the decimal number represented by all the data marks and which decimal number represents the number of duplicates to be made from the respective master; a master blanket cylinder engageable with a master on said master cylinder to have impressed, on its peripheral surface, an ink image of the master then mounted on said master cylinder; an impression cylinder adjacent and movable toward said blanket cylinder to press copy sheets against the peripheral surface of said blanket cylinder to provide duplicates of the master; an etching solution applicator operable to apply an ink-repellent etching solution to the master then mounted on said master cylinder; an inking device operable to apply ink to the master; means operable, responsive to completion of the etching solution application, to activate said inking device to initiate application of the ink to the master; means manually operable to preset a preliminary inking time for applying a quantity of ink sufficient to start duplication of the master; a copy sheet feed device; means operable, upon termination of the preliminary inking time, to activate said copy sheet feed device to initiate and continue feeding of copy sheets between said blanket and impression cylinders; a read-out device operable to scan separately the timing marks and the data marks on each master fed to said master cylinder and, responsive to simultaneous scanning, in each column position, of said data mark and its respective laterally aligned timing mark, providing an output signal representing the decimal digit, in the respective column position of the scanned data mark, whereby to provide decimal output signals indicative of the respective number of duplicates to be made; memory means and a data register connected to said read-out device to receive said output signals and to store and register the indicted number of duplicates; counting means operable to count the number of duplicates produced from each master; signal generating means; coincidence circuit means connected to said memory means; said data register, said counting means and said signal generating means, operable, responsive to coincidence between the stored numbers of duplicates and the counted number of duplicates, to activate said signal generating means to issue a command terminating operation of said copy sheet feed device; master removing means activated, responsive to such command, to remove the master from said master cylinder; and a cleaning device operable automatically, upon completion of duplication of a master, to clean said blanket cylinder.

3,871,295
CAPSULE ORIENTING APPARATUS AND METHOD OF SPIN PRINTING

Edward M. Ackley, Stone Harbor, N.J., assignor to R. W. Hartnett Company, Philadelphia, Pa.

Filed Sept. 4, 1973, Ser. No. 393,939
Int. Cl. B41f *17/36;* **B65g** *47/24*
U.S. Cl. 101—426 **11 Claims**



1. In a capsule orienting and turning apparatus, the combination which comprises:

a continuously movable capsule transporting apparatus having a plurality of spaced-apart pockets for the capsules,

means moving said transporting apparatus to move said pockets from positions facing open upwardly to positions facing open downwardly,

means for feeding a plurality of capsules for reception in said pockets while said pockets are open upwardly,

each said pocket having an elongated pocket portion for receiving said capsule therein with the capsule axis substantially perpendicular to the direction of capsule movement, referred to in this claim as position "A",

each said pocket also having a longitudinal pocket portion arranged to carry the capsule with the capsule axis extending in approximately the direction of its movement, referred to in this claim as position "B",

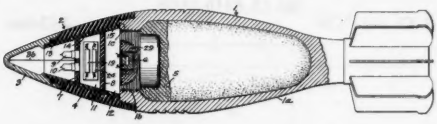
and each said pocket having a laterally extending pocket portion arranged to carry the capsule arranged crosswise of position "A" and also crosswise of the direction of of its movement, referred to in this claim as position "C",

and shifting means, operative while the capsule pockets and capsules are moving, to shift capsules from position "A" to position "B" and then to position "C", with all the cap portions in rectified orientation.

3,871,296
ELECTROSTATIC PROXIMITY FUSE

Laurence B. Heilprin; George Nordquist, and Philip Krupen, all of Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 26, 1951, Ser. No. 217,652
Int. Cl. F42c *13/00*
U.S. Cl. 102—70.2 P **1 Claim**



1. In combination with an explosive missile, an electrostatic fuse comprising: a conical casing mounted at the nose end of said missile, said casing having a metal cap at its narrow end and an insulating skirt between said cap and the body of said missile whereby a capacitance C exists between said cap and said body, said cap and said body having a charge placed thereon during missile launching; a resistance R connected between said cap and said body, said resistance R thereby being in parallel with the capacitance C, the value of said resistance R being such that the time constant RC is long compared to the time the missile is within proximity of a target, but short compared to the time of flight of the missile; a pentode mounted within said missile at its nose end, said pentode having an anode, a cathode, and three grids, the number **2** grid of said pentode being connected to said cap, and the number **1** and number **3** grids of said pentode being connected to said cathode, said cathode being connected to the body of said missile, said number **2** grid thereby being shielded from both said anode and said cathode; a positive voltage source within said missile; a resistor connected between the anode of said pentode and said source; a firing circuit having a thyratron, a charged capacitor, and a detonator, said thyratron having an anode, a cathode, and a grid, said charged capacitor and detonator being connected in the anode circuit of said thyratron; and a coupling network connected between the anode of said pentode and the grid of said thyratron; the greater increase in the capacitance of said cap than that of said body upon approach of said missile to a target causing a change in the voltage across said parallel capacitance C and resistance R, this voltage change being amplified by said pentode and transferred by said coupling network to the grid of said thyratron, whereupon said thyratron conducts causing said charged capacitor to pass a current through said detonator causing functioning thereof.

3,871,297
PERCUSSION FUSES WITH A TILTING ROTOR FOR GYRATORY PROJECTILES

Jean Claude Bayard; Louis Fournet; Jean Jacob, all of Bourges; Bernard Pierre, Lyon, and Marcel Roux, Bourges, all of France, assignors to Etat Francais, Paris, France

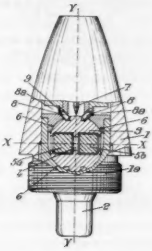
Filed Oct. 11, 1973, Ser. No. 405,301
Claims priority, application France, Oct. 13, 1972, 72.36251
Int. Cl. F42c *15/26*
U.S. Cl. 102—79 **10 Claims**

1. A gyratory percussion fuse comprising:

a fuse body having a longitudinal axis of gyration and adapted for movement along that said axis, and including an upstream percussion element sensitive to impact, a downstream element of the pyrotechnic chain of the fuse, and a tilting rotor arranged, longitudinally, between said percussion element and said downstream element,

said tilting rotor having a passageway extending therethrough from side to side, and a pyrotechnic charge in said passageway, said tilting rotor being entirely symmetrical with respect to a middle transverse plane through the center of said passageway, said rotor further having an axis of inertia, and the weight of said rotor including the pyrotechnic charge being equally balanced,

holding means including a locking device releasable in response to forces generated by a shot for holding the tilting rotor in a rest position with respect to the fuse body prior to a shot, at which rest position said passageway is out of alignment with said percussion element and said downstream element so that the rotor blocks inadvertent movement of the percussion element toward the downstream element, and wherein at said rest position the said axis of inertia of the tilting rotor is at an angle of 90° to the said longitudinal axis of gyration of the fuse body, and said fuse body including means for mounting the tilting rotor so as to permit the tilting rotor to move in either direction from said rest position through a 90° angle to align the passageway with the percussion element and downstream element and hence align the axis of inertia with the longitudinal axis of the fuse body to arm the fuse in response the action of a restoring force operating on the tilting rotor as the rotor is released by said holding means.



3,871,298
DETACHED LEVER TIMING MOVEMENT FOR MECHANICAL TIME FUZE

Dragolyoub Popovitch, Denville, N.J.; Roy B. Nystrom, East Northport, N.Y.; Melvin Eneman, New York, N.Y.; Carl Biro, Yonkers, N.Y., and Selwyn Alpert, Brooklyn, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

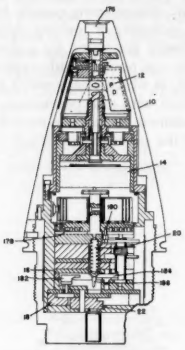
Filed Nov. 6, 1968, Ser. No. 774,231
Int. Cl. F42c *9/04*
U.S. Cl. 102—84 **8 Claims**

1. A timing mechanism for a fuze of the type wherein a lever member operatively engaging a balance wheel assembly, an escape wheel assembly and reciprocating means operatively engaging said escape wheel assembly and adapted to actuate a time delay element of said fuze, the improvement which comprises:

a folded lever member positioned on one side of a common escapement axis operatively engaging said balance wheel assembly and said escape wheel assembly,

a round hairspring operatively engaging said balance wheel assembly and said escape wheel assembly and coaxial with the longitudinal axis of a rotating projectile, permitting said balance wheel oscillation of ± 90° to ± 180° while withstanding a force of 30,000 g's and 30,000 revo-

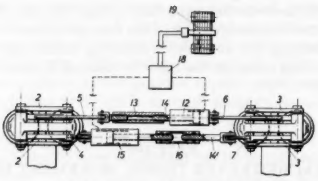
lutions per minute, and
pivot means operatively engaging said escape wheel assembly, said balance wheel assembly, said folded lever and said hairspring.



3,871,299
METHOD AND APPARATUS FOR LINING AND LEVELING TRACK

Franz Plasser, deceased, late of Johannesgasse 3, Vienna, Austria (A-1010, by said Erna Plasser, heir), and Josef Theurer, Johannesgasse 3, Vienna, Austria (A-1010)

Filed Oct. 26, 1973, Ser. No. 410,292
Claims priority, application Austria, Nov. 2, 1972, 9300/72
Int. Cl. E01b *29/26*
U.S. Cl. 104—7 B **5 Claims**



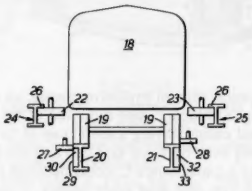
3. In a mobile apparatus for lining and leveling a track, which comprises a frame mounted for mobility on the track, two pairs of rollers mounted on the frame, each pair of the rollers including an outer roller for rolling engagement with an outer lateral face of a respective one of the rails and an inner roller for rolling engagement with an inner lateral face of the respective rail, the rollers of each pair being arranged for clamping the respective rail therebetween, and hydraulically operable lever system for actuating the rollers into and out of clamping engagement with the rails, the improvement of

1. a tension linkage interconnecting the outer rollers of the two pairs and pressing them against the outer lateral faces of the rails,
2. a pressure linkage interconnecting the inner rollers of the two pairs and pressing them against the inner lateral faces of the rails,
3. turnbuckle for adjusting the length of each of the linkages, and
4. a hydraulic piston-and-cylinder drive mounted in each of the linkages.

3,871,300
TRANSPORTATION MEANS

Francis Cyril Perrott, The Manor House, South Cerney, Cirencester, Gloucestershire, England

Division of Ser. No. 190,627, Oct. 19, 1971, Pat. No. 3,777,667, which is a continuation of Ser. No. 779,977, Nov. 29, 1968, abandoned. This application Oct. 30, 1973, Ser. No. 411,060
Claims priority, application United Kingdom, Aug. 21, 1968, 39883/68
Int. Cl. B61b *13/08*
U.S. Cl. 104—130 **2 Claims**



1. Means of transportation comprising:

a. a vehicle,
b. a track having a selective branching zone and at least two alternative branching routes,
c. two alternative guidance means for the vehicle,
d. each said guidance means comprising a stationary guide surface extending substantially continuously along the track through the branching zone and parallel respectively to one of said branching routes,
e. one of said guidance means comprising an inwardly facing surface above the level of the track and the other of said guidance means comprising an outwardly facing guide surface,
f. a vehicle-mounted primary follower associated with and engageable with said inwardly facing guide surface,
g. a vehicle-mounted secondary follower optionally engageable from above with and associated with said outwardly facing guide surface whereby said vehicle can be caused to select and follow that side of the branch corresponding to said outwardly facing guide surface and thereby to disengage said primary follower from said inwardly facing guide surface,
h. said disengagement then taking place solely as a result of transverse movement of the vehicle away from said inwardly facing guide surface, and
i. alternative means by which said secondary follower can be moved clear of the outwardly facing guide surface thereby to cause the vehicle to select and follow that side of the branch corresponding to said inwardly facing guide surface.

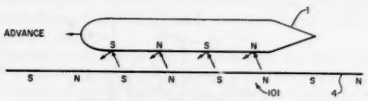
3,871,301
STABILIZATION AND RIDE CONTROL OF SUSPENDED VEHICLES PROPELLED BY A LINEAR MOTOR

Henry H. Kolm, Wayland, and Richard D. Thornton, Concord, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 259,518, June 5, 1972, abandoned. This application Sept. 17, 1973, Ser. No. 398,116
Int. Cl. B61b *13/08*
U.S. Cl. 104—148 SS **17 Claims**

1. Apparatus to provide stabilization and active oscillation damping of a suspended vehicle that comprises, in combination: means on the vehicle for creating a d-c magnetic field, active guideway means adapted to receive the vehicle and containing current loops which, when energized, create a linearly traveling magnetic propulsion field to provide at least one of synchronous acceleration, deceleration and cruise

forces upon the vehicle, electric power source means connected to energize the currents loops, means for effecting momentary adjustment of the amplitude of the propulsion field and its frequency, the latter to change the linear spatial position of the propulsion field relative to that of the vehicle field, sensor means on the vehicle to sense vehicle motion in



at least one degree of freedom for the purpose of controlling vehicle behavior by actively damping unwanted motion, and communication means operable to transmit a signal from the sensor means to the power source to effect changes therein, thereby to adjust at least one of the amplitude and the frequency of the propulsion field so as to provide stabilization and oscillation damping of the vehicle.

3,871,302

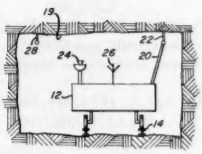
TROLLEY CONTROL SYSTEM

Will B. Jamison, Bethel Park; John F. Burr, Pittsburgh, and Homayoun Hadi, Bethel Park, all of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Sept. 26, 1973, Ser. No. 401,079

Int. Cl. B60m *1/10*; B61l *1/10*

U.S. Cl. 104—153 **13 Claims**



1. Apparatus for controlling the supply of electric current to a trolley wire comprising,

a transmitting means for transmitting a first coded signal,

receiving means for receiving the first coded signal,

said receiving means positioned remote of said transmitting means,

circuit breaking means for controlling the flow of electric current to said trolley wire,

said circuit breaking means actuated by said receiving means upon receipt of the first coded signal to provide flow of electric current to said trolley wire and thereby energize said trolley wire at a preselected current magnitude,

said transmitting means operable to transmit a second coded signal to said receiving means, and

said circuit breaking means actuated by said receiving means upon receipt of the second coded signal to override said first coded signal which is transmitted from another transmitting means in order to interrupt current flow to said trolley wire.

3,871,303

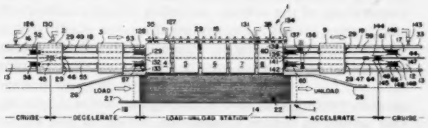
TRANSPORTATION SYSTEM

Gerald L. Woodling, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 25, 1974, Ser. No. 445,446

Int. Cl. B61b *9/00*

U.S. Cl. 104—173 **15 Claims**



1. A vehicle drive system comprising a first endless drive member for driving engagement with a first vehicle and a second vehicle along a path in a constant speed section of the system, a second endless drive member for driving engagement with said first vehicle in a variable speed section of the system, a third endless drive member for driving engagement with said second vehicle in said variable speed section of the system, means for gradually changing the speed of said second endless drive member between the speed of said first endless drive member and a different speed in a different speed section of said system whereby the speed of said first vehicle can be gradually changed from said speed of said first endless drive member to said different speed and a second means for gradually changing the speed of said third endless drive member whereby more than one vehicle is driven at gradually changing speeds in said variable speed section at the same time.

3,871,304

SUSPENSION APPARATUS FOR ENDLESS MONOCABLE AND BICABLE AERIAL ROPEWAYS WITH CLAMP CONTROL

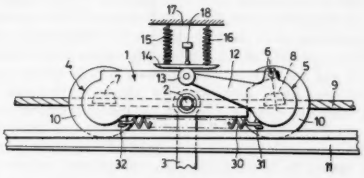
Giorgio Dettoni, Turin, Italy, assignor to Officine Meccaniche Agudio S.p.A., Milan, Italy

Filed Sept. 14, 1973, Ser. No. 397,389

Claims priority, application Italy, Sept. 21, 1972, 29480/72

Int. Cl. B61b *7/20*

U.S. Cl. 104—178 **5 Claims**



1. A suspension device for clamping a transport vehicle to the haulage rope of an aerial ropeway and controlling the clamping hold on the rope, said device comprising in combination:

a support structure guided for movement along and parallel to the haulage rope;

a pair of clamping means supported on said support structure lengthwise spaced apart, one of said clamping means being stationarily mounted on the support structure and the other clamping means being slidable relative to said one clamping means, spring means biasing said clamping means toward a relative position in which the clamping means produce a predetermined holding force, at least one of said clamping means including a clamping member clampingly engageable with the haulage rope and a control member said clamping member, said control member being pivotal about an axis eccentric relative to the loca-

tion of the clamping member on the control member, the angular position of the control member and thus of the clamping member controlling the clamping force exerted by said clamping member; and

control means for controlling release or stoppage of the transport vehicle as a function of the clamping force exerted by said clamping means, said control means including sensing means effecting release and stoppage respectively of the vehicle, actuating means coactingwith said sensing means for activating the same, elastic means supporting said activating means, and linkage means secured to said control member mounting the clamping member for pivoting in unison therewith, said linkage means coacting with said actuating means for displacing said actuating means against the action of the elastic means into a position causing the sensing means to effect release of the vehicle in response to a pivotal position of the control member indicative to a predetermined minimum clamping pressure and also permitting movement of the actuating means by the action of the elastic means into a position in which the sensing means are inactive thereby effecting stoppage of the vehicle.

3,871,305

APPARATUS FOR USE IN QUENCHING AND ABSORBING GAS EMANATING FROM A WASTE INCINERATOR

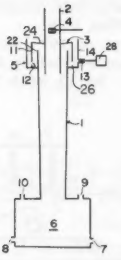
Tetsuya Watanabe, and Noboru Suzuki, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 20, 1973, Ser. No. 371,607

Claims priority, application Japan, June 22, 1972, 47-73045; May 9, 1973, 48-50651

Int. Cl. F23j *15/00*; **B01d** *47/00*

U.S. Cl. 110—119 **12 Claims**



1. An apparatus for use in quenching and absorbing gas emanating from a waste incinerator, said apparatus comprising a pipe connected to said waste incinerator for receiving said gas, fluid spray means disposed in said pipe, a quenching tower having an open, upper end portion, said pipe having an end portion of a diameter smaller than the diameter of said quenching tower and telescoped within said open end portion of said tower to define an annular space between said telescoping portion, a cover extending from a non-telescoping portion of said pipe and over said open end portion of said tower, a water sink supported by said tower, said sink enclosing said cover and having a portion extending above said cover, means to introduce a fluid into said sink to flow into said annular space, and means for adjusting the flow rate of said fluid into said sink whereby said fluid flows over the interior surface of said tower and submerges said cover to form a fluid seal between said cover and said pipe.

3,871,306

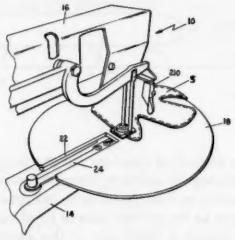
FEED CONTROL

Robert B. Egtvedt, Comstock Park; John R. Den Bleyker, Holland, and Theodore C. Zwiep, Grand Rapids, all of Mich., assignors to Wolverine World Wide, Inc., Rockford, Mich.

Filed Mar. 12, 1973, Ser. No. 339,776

Int. Cl. D05b *23/00, 27/06*

U.S. Cl. 112—121.11 **8 Claims**



1. Stock feed apparatus for controllably feeding stock to a functional tool comprising:

stock feed means shiftable repeatedly toward and away from a tool zone and being adapted to alternately secure and release stock for incremental feed thereof relative to said tool zone; means for repeatedly shifting said stock feed means toward and away from the tool zone; said stock feed means including an upper pressure element and a cooperative lower platform for securing the stock, each of which is pivotable, for rotatably shifting the secured stock about said tool zone simultaneously while feeding the stock toward said tool zone; and sensing and responsive means on said pivotable stock feed means to detect a predetermined feature of the stock and control the pivoting of said stock feed means accordingly.

3,871,307

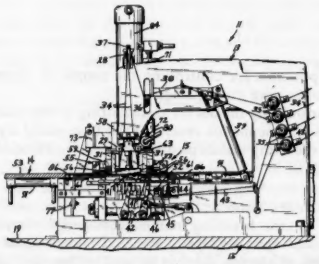
PLACKET FORMING MACHINE

Rollo L. Scott, Minneapolis, and Robert F. Overby, Bloomington, both of Minn., assignors to Munsingwear, Inc., Minneapolis, Minn.

Filed Apr. 5, 1973, Ser. No. 348,267

Int. Cl. D05b *21/00*

U.S. Cl. 112—121.15 **7 Claims**



1. In sewing apparatus comprising a sewing machine having a first and second widely spaced needles, first and second thread carrying loopers arranged for cooperation severally with the first and second needles to comprise first and second needle and looper pairs, an independent tensioned supply of thread for each of the needles and loopers, and drive means energizable to cause coordinated sewing movement of said needles and loopers and effective when deenergized to return

said needles and loopers to predetermined positions, combined with means for holding a multi-layer work piece and automatically drawing the work piece past the needles in a direction normal to the plane of the needles to produce a pair of widely spaced two-thread chain stitches along the work piece, the improvement which comprises:

means interrupting the energization of the sewing machine drive means at the end of a predetermined travel of the work piece while causing the work piece to creep slightly further whereby to ensure that the needle and looper threads beneath the work piece are taut and in predetermined locations;

a first cutter cooperating with a first needle and looper pair and a second cutter cooperating with the other needle and looper pair, each cutter comprising a movable knife member having a pointed end of reduced thickness and having a hooked recess along one edge thereof at a location spaced from the point, means reciprocating the knife member between a first, extended position and second, retracted position, and means cooperating with the knife member for shearing threads carried in said recess during retraction of the knife member;

and means mounting the cutters adjacent the loopers so that upon extension the point of each knife member moves close to the adjacent looper whereby the needle and looper threads from the stitch last made enter the recess in the knife, and upon retraction the threads are carried to the cooperating means for severing.

3,871,308

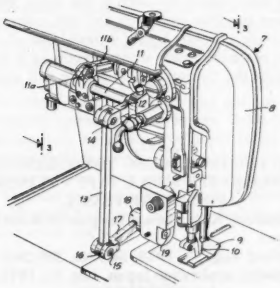
SEWING MACHINE FABRIC-CUTTING DEVICE

William Galya, Rte. 2, Merriden Dr., Brewster, N.Y. 10509, and Jack E. Shuffield, 29 Carpenter Ave., Norwood, N.J. 07648

Filed Dec. 10, 1973, Ser. No. 423,235

Int. Cl. D05b *37/06*

U.S. Cl. 112—122 **3 Claims**



1. A sewing machine device comprising in combination: a cutter blade means including a first lower cutting edge and an upper mounting structure, an upright guide means for guiding the blade means' lower cutting edge and upper mounting structure upwardly and downwardly reciprocatably, means slidably mounting the upper mounting structure on the upright guide means with the lower cutting edge extending fore-to-aft in direction, a sewing machine foot and needle sewing means positioned in juxtaposition and lateral to the cutter blade means and to said fore-to-aft direction, and drive means operatively connected to the upper mounting structure for reciprocating the upper mounting structure in to and fro motion along the upright guide means, the upright guide means including at least two uprightly extending guide tracks in which the upper mounting structure is slidably mounted, the drive means including a power-driven eccentric shaft, and a lever means including a plurality of interconnected levers extending operatively between and connected to each of the eccentric shaft and the upper mounting structure for translating rotary motion of the eccentric shaft into to and fro reciprocating motion of the upper mounting structure, the lever means including lever-mounting structure mounting the levers at locations above the lower cutting edge.

3,871,309

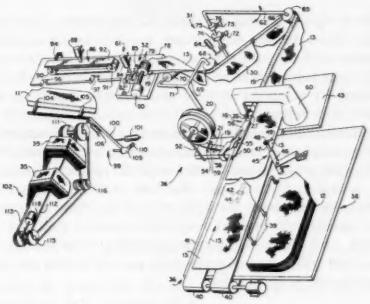
SHIRT FRONT ASSEMBLY, METHOD AND APPARATUS

Wade W. Frost, Vidalia, Ga., assignor to Oxford Industries, Inc., Atlanta, Ga.

Division of Ser. No. 243,753, April 13, 1972, Pat. No. 3,780,682, which is a continuation-in-part of Ser. No. 79,031, Oct. 8, 1970, Pat. No. 3,675,604. This application Aug. 27, 1973, Ser. No. 391,645

Int. Cl. D05b *19/00*

U.S. Cl. 112—121.29 **3 Claims**

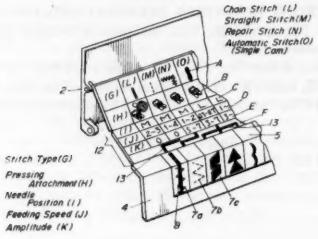


1. Apparatus for forming shirt front assemblies or the like comprising a fabric connecting means, first feeding means for feeding a connected series of center plait pattern parts or the like to said fabric connecting means, second feeding means for feeding a series of shirt front pattern parts or the like to said fabric connecting means whereby said fabric connecting means connects together the connected series of center plait pattern parts and the series of shirt front pattern parts and forms a connected series of shirt front assemblies, and conveying means for guiding the connected series of center plait pattern parts of the shirt front assemblies away from said fabric connecting means toward a subsequent work station, said conveying means comprising first roller means adjacent said fabric connecting means for guiding the center plait pattern parts in an approximately horizontal attitude, a second roller means for receiving the center plait pattern parts from the first roller means and turning the center plait pattern parts to an inclined attitude with the shirt front pattern parts hanging freely from the center plait pattern parts, and third roller means adjacent the subsequent work station for receiving the center plait pattern parts from the second roller means and turning the center plait pattern parts back to an approximately horizontal attitude, said second roller means being biased out of alignment from between said first and second roller means to exert tension on the connected series of center plait pattern parts and to accumulate varying lengths of shirt front assemblies as the center plait pattern parts are moved away from the fabric connecting means toward the subsequent work station, whereby the center plait pattern parts function as a conveyor tape for the shirt front assemblies.

3,871,310
ZIG-ZAG SEWING MACHINE

Susumu Hanyu, Tokyo, Japan, assignor to Janome Sewing Machine Co., Tokyo, Japan

Filed Jan. 9, 1973, Ser. No. 431,560
Claims priority, application Japan, Jan. 7, 1974, 48-4926
Int. Cl. D05b 3/02
U.S. Cl. 112—158 F 10 Claims

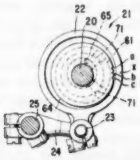


1. In a zig-zag sewing machine having pattern cams and a pattern cam selecting mechanism, a combination comprising a pattern cam selector dial provided with a plurality of first indicia each representative of a stitching pattern which can be produced by selecting one of said pattern cams; an index movable with reference to said dial to indicate respective ones of said first indicia, and being connected with said pattern cam selecting mechanism so as to select during such movement the pattern cam which is associated with the respective first indicium; a table adjacent said dial and provided with second indicia some of which are indicative of machine adjustments to be carried out when a respective pattern cam has been selected; and indicating means extending between said first and second indicia to indicate which second indicia are associated with which first indicia.

3,871,311
ADJUSTABLE ECCENTRIC FOR SEWING MACHINES

Heinrich Ciecior, Blankenloch, and Rolf Emil Kessler, Karlsruhe, both of Germany, assignors to The Singer Company, New York, N.Y.

Filed Nov. 15, 1973, Ser. No. 416,145
Int. Cl. D05b 57/02
U.S. Cl. 112—200 1 Claim

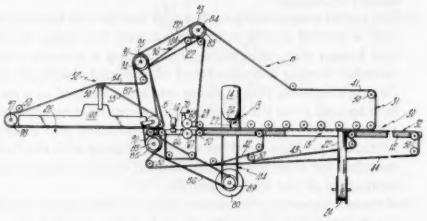


1. In a sewing machine having a rotary drive shaft, an oscillatory stitch forming mechanism, an adjustable throw eccentric carried on said drive shaft, and a pitman embracing said adjustable throw eccentric and operatively connected to said stitch forming instrumentality, said adjustable throw eccentric comprising telescopically arranged inner and outer eccentric members each formed with a radial flange, the flanges extending one on each side of said pitman, fastening means carried by the radial flange of said outer eccentric member and engageable with said drive shaft to lock said adjustable eccentric members in selected position on said shaft, indicia carried on said pitman and on the radial flange of said inner eccentric member denoting the eccentricity of said adjustable eccentric, and cooperating indicia carried on said pitman and on the radial flange of said outer eccentric member denoting the timing of said adjustable eccentric.

3,871,312
SEWING MACHINE MATERIAL FEED MECHANISM

John L. Rockerath, and Harold J. Schreck, both of Utica, N.Y., assignors to Jetsew, Inc., Barneveld, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,904
Int. Cl. D05b 19/00, 27/00
U.S. Cl. 112—203 17 Claims

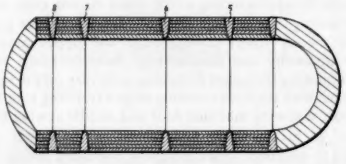


1. In a sewing machine installation having material conveyance means for conveying material forwardly along a predetermined material path through material handling, stitching and cutting stations to a material stacking station, a sewing machine head for stitching the material at the stitching station, a cutting device for cutting the stitched material at the cutting station, and material handling apparatus for handling the material in a predetermined was as it is conveyed forwardly along the material path through the material handling station, the improvement wherein the material conveyance means comprises an entry conveyor system for conveying the material forwardly along the material path through the material handling and stitching stations to the cutting station, an exit conveyor system for conveying the material forwardly along the material path from the cutting station to the stacking station, and drive means for driving the entry and exit conveyor systems together and with the exit conveyor system driven to provide a slightly higher material rate of conveyance to place the material under slight tension as it is conveyed forwardly from the cutting station by the exit conveyor system.

3,871,313
METHOD FOR INCREASING THE STRENGTH OF A MULTIPLE-LAYER SHELL TYPE CYLINDRICAL PRESSSURE VESSEL

Takeshi Yamauchi, Kobe, Japan, assignor to Kobe Steel, Ltd., Kobe, Japan

Filed Aug. 17, 1973, Ser. No. 389,262
Claims priority, application Japan, Aug. 17, 1972, 47-82395
Int. Cl. B21d 51/00
U.S. Cl. 113—120 S 3 Claims



1. A method for increasing the strength of a multiple-layer shell type cylindrical pressure vessel having head plates, the shell of which, when inner pressure is applied to the vessel, tends to present a sine-curve like bending behavior with a transition point at the neutral axis at each curvature, the method comprising:

constructing said shell of more than one section wherein at least one of said sections is constructed of more than one layer,

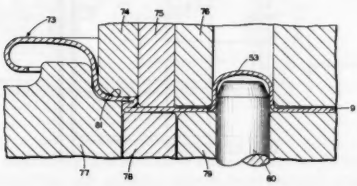
providing a circumferential weld between one of said head plates and one of said sections, and

providing a circumferential weld extending throughout the wall thickness of said shell at a position coinciding with a first of said transition points with respect to the bending direction as viewed from said circumferential weld between said one of said head plates and said one of said sections.

3,871,314
METHOD OF MAKING FOLDED CAN ENDS AND FOLDED CAN END PRODUCT

Donald E. Stargell, North Canton, Ohio, assignor to Van Dorn Company, Cleveland, Ohio

Filed Oct. 20, 1972, Ser. No. 299,447
Int. Cl. B21d *51/40*
U.S. Cl. 113—121 C **22 Claims**



1. In a method of cold working a sheet metal blank to form a can end member having a recessed end panel extending from a recessed corner and connected with the corner by an annularly scored protective metal triple fold by a series of successive drawing, redrawing, resizing, scoring and folding operations in which said successive operations include forming an annular fold panel extending directly between an upper concavely curved corner formed in an axially extending side wall of a cup drawn from a metal blank and a lower curved corner connected with the cup bottom wall; forming an annular upwardly convex shoulder in the fold panel between the upper and lower corners; successively bulging the cup wall portion circumferentially outward between the shoulder and lower corner; successively decreasing the depth of the cup bottom wall below the shoulder; and successively decreasing the radius of curvature of the lower corner in preparation for folding the metal between the shoulder and lower corner to form an annular triple fold-S-shaped in cross section between the shoulder and lower corner.

3,871,315
DEVICE FOR SALVAGING METAL OBJECTS AND SALVAGING METHOD

Leonard Morgansen Andersen, 46 Alexander Ave., Yonkers, N.Y. 10704

Filed June 20, 1973, Ser. No. 371,875
Int. Cl. B63c *7/04*
U.S. Cl. 114—51 **6 Claims**

1. A submersible device for use in salvaging metal objects from a body of water, comprising

a housing having an opening at one end;

a compressed thermit mixture within said housing, said thermit mixture being enveloped by a flux material;

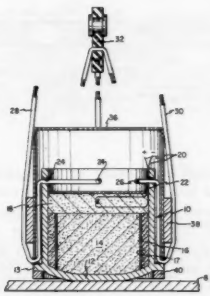
a metal container enveloping said housing to form an insulating air space between the interior surface of said container and said housing, with means forming a watertight seal between said container and said housing;

an igniting powder above the thermit mixture within said housing, said igniting powder being of the type which does not emit gases upon ignition;

means for igniting said igniting powder;

means for sealing the open end of said housing;

means enveloping the closed end of said housing for directing the flow of molten metal after said thermit mixture has been ignited toward a confined area of an object to be salvaged; and

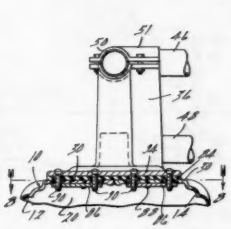


lifting means connected to said housing for enabling said housing to be pulled toward the surface of the water after it has been welded to a metal object by ignition of said thermit.

3,871,316
CATAMARAN

Kenneth H. Woodrich, Rochester, Mich., assignor to Woodall Industries Inc., Detroit, Mich.

Division of Ser. No. 182,743, Sept. 22, 1971, Pat. No. 3,796,175. This application Sept. 6, 1973, Ser. No. 394,639
Int. Cl. B63b *9/00*; **B63h** *9/04*; **B63b** *1/10*
U.S. Cl. 114—61 **4 Claims**

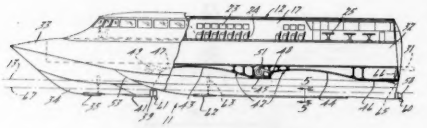


1. A catamaran comprising a pair of hollow plastic hulls each having a mounting portion provided with an opening therein, a stanchion mounted on each of said mounting portions over the opening thereof, mounting plate means disposed against the interior of each of said hulls in generally surrounding relation to said opening, said mounting plate means being insertable into said hulls through said openings, and fastening means extending between said stanchions and said mounting plate means in locations spaced around said opening to secure said stanchions to said mounting portions, said stanchions being operable to close said openings and being in sealed relation to said mounting portions around the openings thereof.

3,871,317
WATERCRAFT

Jack J. Szpytman, 910 N. Brys Dr., Grosse Pointe Woods, Mich. 48236

Filed July 16, 1973, Ser. No. 379,333
Int. Cl. B63b *1/30*
U.S. Cl. 114—66.5 R 13 Claims

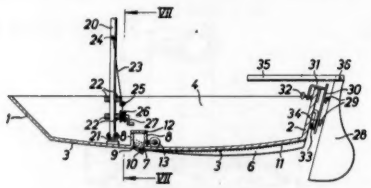


1. A watercraft comprising an elongated hull, an undersurface on said hull having a concavely curved aerodynamic lifting shape configured to provide an upwardly acting force applied to said craft in response to flow of air therealong, stabilizing fin means carried by laterally spaced portions of said hull below said aerodynamic lifting surface, each of said last-mentioned hull portions carrying said stabilizing fin means at its lower end, each of said stabilizing fin means having a generally flat horizontal lateral configuration in cross section with exposed downwardly facing and upwardly facing surfaces extending laterally outwardly on opposite sides of said lower end, and propulsion means carried by said hull, said aerodynamic lifting surfaces comprising two concave surfaces in tandem, each surface comprising an upwardly and aftwardly extending forward portion, a substantially horizontal intermediate portion, and a downwardly and aftwardly extending rearward portion, a flat surface being provided on the underside of the hull between said two aerodynamic sections.

3,871,318
ANTIFRICTION DEVICE FOR BOAT HULLS

Ernest Joscelyn Clerk, 18 South Ave., Rest Pen, Kingston 10, British W. Indies

Division of Ser. No. 262,214, June 13, 1972, abandoned. This application Aug. 3, 1973, Ser. No. 385,569
Int. Cl. B63b *1/38*
U.S. Cl. 114—67 A 7 Claims

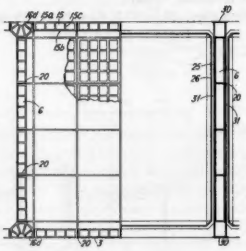


1. A sailing boat including a hull having a flat bottom, rudder means mounted to said hull, the bottom of the hull having a slot extending transversely thereof and communicating with ambient air, a partition wall extending upwardly from and along each transverse edge of the slot within the hull, a flap extending transversely across the bottom of the hull and on the exterior thereof, the flap being disposed with the leading edge thereof extending along the leading edge of the slot and to which it is hingedly connected by a hinge coupling and means operable from inside the hull for effecting hinged movement of the flap, said flap being of a length such that it extends across the space between the leading edge of the slot and the trailing edge thereof and the flap is adjustably movable from a position where it contacts the trailing edge of the slot and closes the slot to selected hinged positions opening the slot to a varying extent to direct air flow rearward from said slot against said hull bottom, thereby reducing wetted areas of said hull bottom when said boat is being wind-propelled, and means for holding said flap in said selected positions.

3,871,319
BUOYANT VESSELS

Frederick Henry Turner, Crestline, Cullesden Rd., Kenly, Surrey, England

Filed Nov. 30, 1971, Ser. No. 203,212
Claims priority, application United Kingdom, Dec. 4, 1970, 57645/70; Mar. 24, 1971, 7680/71; June 21, 1971, 28906/71; June 21, 1971, 28907/71; June 21, 1971, 28909/71
Int. Cl. B63b *25/08*
U.S. Cl. 114—74 A 2 Claims

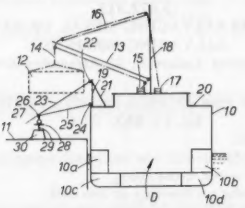


1. A buoyant vessel in which cryogenic liquid may be contained comprising outer walls and at least one bulkhead that divides the space defined by the outer walls into compartments, said walls and bulkhead being formed from prestressed concrete providing boundary layers between which struts exist, insulating material internally lining each said compartment and heating means by which said bulkhead may be heated positioned on opposite sides of said bulkhead in said insulating material.

3,871,320
APPARATUS FOR COUNTERACTING A TILTING OF A SHIPS'S HULL DURING LOADING AND UNLOADING

Leif Berg, Risskov, Denmark, and Ragnar Jonas Nes, Minde, Norway, assignors to Ingeniorene Lund, Mohr & Glaever-Enger, Bergen, Norway

Division of Ser. No. 112,667, Feb. 4, 1971, Pat. No. 3,716,154. This application Jan. 17, 1973, Ser. No. 324,389
Claims priority, application Norway, Feb. 6, 1970, 414/70
Int. Cl. B63b *39/00*
U.S. Cl. 114—121 8 Claims



1. An apparatus for counteracting a tilting of a ship's hull during loading and unloading comprising
a supporting leg mechanism;
means for pivotally mounting said supporting leg mechanism on a ship for pivoting from an inoperative position on board the ship to a position over a supporting surface adjacent the ship at a level above the waterline of the ship;

means including a pressure medium cylinder connected to said supporting leg mechanism for maneuvering said supporting leg mechanism to a position to engage said supporting surface adjacent the ship and to apply an initial load through said supporting leg mechanism on said supporting surface; and

a manometer connected to said pressure medium cylinder to indicate the pressure of a pressure medium therein.

3,871,321

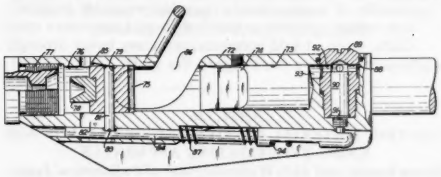
SELF-COCKING EXPLOSIVELY ACTUATED CABLE CUTTER

Joseph L. Giebel, Pittsburgh, and Ernest E. Temple, Murrysville, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Division of Ser. No. 163,949, July 19, 1971, Pat. No. 3,780,689. This application Sept. 10, 1973, Ser. No. 395,577

Int. Cl. B63b *9/00*

U.S. Cl. 114—221 A **4 Claims**



1. An explosively actuated cable cutter comprising a frame having a rear end and provided near its front end with a laterally opening recess for receiving a cable, an anvil member mounted in the frame between its front end and said recess and slidable lengthwise of the frame, the anvil member being in a position to be moved forward by a cable entering the recess, a chisel slidably mounted in the frame behind the recess and having a front cutting end, a firing pin in the frame behind the chisel for detonating an explosive charge to drive the chisel forward in order to sever a cable against the anvil member, a plunger for actuating the firing pin carried by the frame beside said anvil member and chisel and slidable lengthwise of the frame, the plunger being provided with a lateral notch adjacent the anvil member, said anvil member having a passage therethrough normally aligned with said notch, a trigger pin slidably disposed in said passage and having one end normally projecting into said plunger notch for moving the plunger forward with the trigger pin and anvil member, the frame having an inner surface engageable by the end of the trigger pin opposite said one end and sloping forward and away from the anvil member, the front end of said notch sloping in the same direction as said sloping frame surface, whereby when the anvil member is moved forward by a cable in the recess the pin will move along said sloping surfaces and lengthwise of said passage until the pin leaves said plunger notch, and a spring between the frame and plunger adapted to be compressed by the forwardly moving plunger until the trigger pin leaves said notch and releases the plunger, whereupon the spring will drive the plunger rearwardly to actuate the firing pin.

3,871,322

SNUBBER FOR THE DAGGER BOARD OF A SAILBOAT

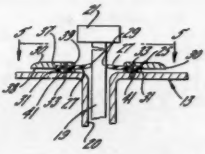
Marlow W. Dodge, 6312 Park Ridge Rd., Rockford, Ill. 61111

Filed July 5, 1973, Ser. No. 376,693

Int. Cl. B63b *41/00*

U.S. Cl. 114—127 **4 Claims**

1. A snubber mountable on a sailboat adjacent the dagger board slot and adapted to grip against the sides of a dagger board of predetermined thickness to support the board in a raised position, said snubber including first and second flat fins formed of a resiliently yieldable material, a first bracket for securing said first fin to the boat along one side of the slot with the first fin having one side margin secured to the boat and having an opposite side margin extending partially over the slot, a second bracket for securing said second fin along the opposite side of the slot with said second fin extending



partially over the slot toward the other fin, the side edges of said fins being spaced from each other a distance less than the thickness of said dagger board so as to grip frictionally against the sides of the dagger board to support the latter in said raised position.

3,871,323

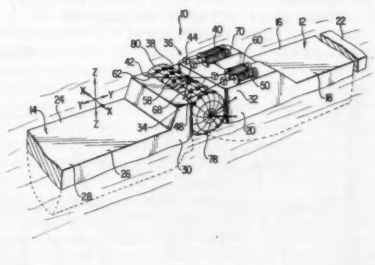
CLOSE-COUPLED TOWING LINKAGE

Donald P. Roseman, Rockville; Milton Martin, Silver Spring, and Eugene R. Miller, Annapolis, all of Md., assignors to Hydronautics, Incorporated, Laurel, Md.

Filed Aug. 31, 1973, Ser. No. 393,479

Int. Cl. B63b *21/00*

U.S. Cl. 114—235 A **8 Claims**



1. A towing linkage of connecting a first vessel to a second vessel and permitting relative yaw, surge and sway while limiting the amount of these motions comprising in combination:

a. a first main resilient towing link for resiliently connecting the two vessels at their port sides;

b. a second main resilient towing link for resiliently connecting the two vessels at their starboard sides, said main resilient towing links permitting surge between the vessels while providing surge restraint;

c. a first transverse resilient link for connecting the port side of the first vessel of the starboard side of the second vessel;

d. a second transverse resilient link for connecting the port side of the second vessel to the starboard side of the first vessel, said transverse links permitting relative sway between the vessels while providing sway restraint; and

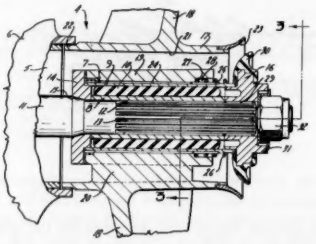
e. pneumatic fender means between the first and second vessels to provide surge and yaw restraints.

3,871,324

OUTBOARD PROPULSION UNIT EXHAUST DISCHARGE SYSTEM

Richard H. Snyder, Oshkosh, Wis., assignor to Brunswick Corporation, Chicago, Ill.

Filed Jan. 31, 1969, Ser. No. 795,434
Int. Cl. B63h *1/20*
U.S. Cl. 115—17 **27 Claims**



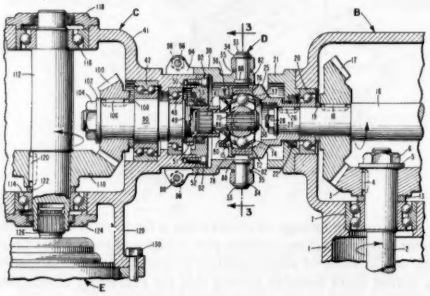
24. In a marine propulsion device comprising a lower unit including an exhaust gas discharge passageway terminating in an exhaust gas discharge port, a rotatably mounted porpeller shaft extending through said port, a clutch mechanism selectively connecting said propeller shaft in forward drive and in rearward drive and a propeller mounted on said propeller shaft for rotation therewith and including a blade having a rear face and an exhaust gas passageway having an inlet communicating with said exhaust gas discharge port and an outlet rearwardly of said blade, the improvement in combination therewith comprising means for affording underwater exhaust gas discharge through said port and into the water around said lower unit forwardly of the rear face of said propeller blade when said device is in reverse drive.

3,871,325

MARINE DRIVE SYSTEM

Sidney W. Raulerson, P. O. Box 2307, Miami, Fla. 33012

Filed Jan. 11, 1973, Ser. No. 322,744
Int. Cl. B63h *5/08*
U.S. Cl. 115—34 R **9 Claims**



1. A marine drive system for drivingly connecting a single marine engine to a plurality of marine propeller shafts comprising:

a power distribution unit operably connectable to a marine engine;

a plurality of articulated power transmitting means connected to said power distribution unit, each of said transmitting means including, a first housing section, a first shaft rotatably mounted in said first housing section and drivingly connected to said power distribution means, a second housing section, a second shaft positioned in said second housing section, a universal joint drivingly connecting said first shaft to second shaft, a gimbal element positioned about a portion of said first housing section and a portion of said second housing section, said first housing section being pivotally connected to said gimbal element for relative rotation therebetween about a first axis, said second housing section also being pivotally connected to said gimbal element for relative rotation therebetween about a second axis perpendicular to said first axis, said first and second axes intersecting at substantially the pivot center of said universal joint, a third housing section, said second and third housing sections being adjustably engaged for relative axial movement therebetween and being provided with clamping means for fixing the axial adjustment between said second and third housing sections, and a third shaft rotatably mounted in said third housing section, said second shaft being drivingly connected to said third shaft, said second and third shafts also being adjustably engaged for relative axial movement therebetween, whereby said third shaft is angularly and axially movable with respect to said first shaft; and

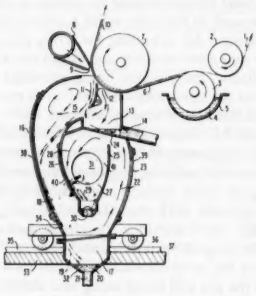
a plurality of independently operable reversible transmission means operably connected to said respective third shafts, each of said transmission means being drivingly connectable to a marine propeller shaft.

3,871,326

COATING MATERIAL RECOVERING DEVICE FOR AIR KNIFE TYPE COATING APPARATUS

Masao Kanda, and Akio Watanabe, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed June 20, 1973, Ser. No. 371,796
Claims priority, application Japan, June 20, 1972, 47-061480
Int. Cl. B05c *11/06*
U.S. Cl. 118—63 **4 Claims**



1. In a coating apparatus, means for removing and recovering excess coating material from a web coated in an air knife coating apparatus, said removing and recovering apparatus comprising:

a. means for applying a flowing gas stream tangentially to the web for removing excess coating material from the web which is entrained in the flowing gas stream;

b. a separating plate adjacent said web extending transversely to the flow path of the flowing gas stream containing the excess coating material downstream of the contact area of the flowing gas stream with the web for separating excess coating material from the flowing gas stream;

c. a drip pan underlying said separating plate to catch liquid material flowing downwardly on the separating plate under gravity influence;

d. means including said drip pan forming a first chamber for recovery of said excess coating material, the improvement wherein:

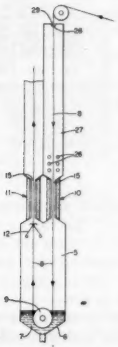
e. said first chamber includes chamber wall means to the side of said separating plate opposite the means applying the flowing gas stream, spaced from said plate and extending from said drip pan to the vicinity of said web to form with said drip pan and said separating plate a volume in which separated air moves slowly downwardly behind the separating plate to cause the fine coating material component thereof to gravity deposit into said underlying drip pan; and wherein

f. said separating plate is positioned with respect to said gas stream, said web and said drip pan such that the flowing gas stream does not directly enter said first chamber and re-entrain substantial amounts of already separated coating material during gravity deposit from said separating plate into said drip pan.

3,871,327
DIP TANK WITH VAPOR CONDENSING CONTAINING SEAL

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 25, 1974, Ser. No. 464,016
Int. Cl. B05c *3/12*
U.S. Cl. 118—69 **3 Claims**



1. An apparatus for treating tire cord fabric, comprising in combination;

a. a chamber sealed from the ambient atmosphere, the chamber including entrance and exit openings disposed in the chamber in spaced relation, each of the openings including an elongated, restricted throat smaller than the chamber;

b. a dip tank disposed in the chamber in spaced vertical relation below the openings in the chamber, the tank containing a liquid coating comprising a mixture of an agent for promoting the bond between tire cords of the fabric and rubber material used in the production of tires, and a vaporizable solvent which is a carrier of the agent;

c. means for guiding the fabric into the liquid coating in the dip tank and through the openings in the chamber;

d. a seal for each of the openings in the chamber, the seals designed to keep vapor of the solvent from passing through the openings, each of the seals comprising:

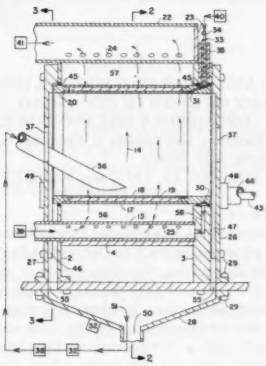
1 a pair of condensers disposed in each of the throats adjacent opposing sides thereof, the condensers of each pair of condensers being spaced from about 1¼ inches to about 3 inches apart such as to be in close proximity to fabric passing therebetween, each condenser including a plate coil comprising serpentine mounds extending towards the fabric moving between the condensers, the mounds including fluid passageways through which coolant is circulated; and

2. means for circulating a cooling fluid through the fluid passageways of each of the condensers.

3,871,328
COATING CHAMBER

William P. English, 17 Strong Ct., Plainville, Conn. 06062

Filed Apr. 13, 1972, Ser. No. 219,222
Int. Cl. B05c *5/02*
U.S. Cl. 118—629 **5 Claims**



1. In a chamber for coating articles with powder, a rotatable cylinder having a porous circumferential wall, end rings attached to said wall, spacers separating said end rings and supporting said circumferential wall, a chamber for pressurized fluid external to and exposed to a sector of said wall, a chamber for suction of fluid external to and exposed to a sector of said wall, sealing means between said chambers for pressurized and suction fluids, and said end rings means to provide pressurized fluid to said chamber for pressurized fluid and means to provide suction to said chamber for suction of fluid, means for feeding powder into said cylinder, means for removing excess powder from said cylinder, means for conditioning excess powder and recirculating it back into said cylinder, walls enclosing said cylinder and chambers, said walls having openings for means to convey articles being coated into and out of said cylinder, and means for rotating said cylinder.

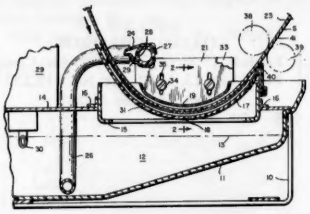
3,871,329
DEVELOPMENT ELECTRODE

John M. Anemaet, Millis, Mass., assignor to Dennison Manufacturing Co., Framingham, Mass.

Filed Oct. 16, 1972, Ser. No. 297,779
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **14 Claims**

1. Apparatus for developing electrostatic images on sheet material comprising a developer station, means for moving said sheet material through said developer station, an upper electrode at said developer station, a lower electrode at said developer station positioned opposite said upper electrode, said sheet material being conveyed between the electrodes, said upper electrode and said lower electrode being of perfo-

rated material and being equipotential members, said lower electrode being in contact with said moving sheet material,



and the spacing between the electrodes being less than about ¼ inch.

3,871,330

PROCESS AND APPARATUS FOR THE IMMOBILIZING AND STUDY OF GROWTH ORGANISMS, INCLUDING DROSOPHILA MELANOGASTER

H. Damon Swanson, and Glenda A. Swanson, both of 88 West St., Concord, N.H. 03301

Filed Oct. 17, 1973, Ser. No. 407,175

Int. Cl. A01k *1/00*

U.S. Cl. 119—1 **3 Claims**

1. A process for the immobilized manipulation and study of the growth of organisms such as Drosophila Melanogaster and the like, that comprises, disposing a growth medium for the organisms in the base of a flat-lid covered chamber, inserting the organisms within the chamber, inverting the chamber, placing the inverted chamber with the outer surface of its flat lid in contact with a refrigerated surface, maintaining said surface contact until the organisms within the medium and chamber have become cold-immobilized and have fallen under the influence of gravity upon the inner surface of the inverted flat lid, removing the medium-containing base to expose the immobilized organisms on the flat lid inner surface to the exterior environment to enable manipulation and study, and continuing to maintain the organisms immobilized by continuing said contact with the refrigerated surface for the desired period of such manipulation and study.

3,871,331

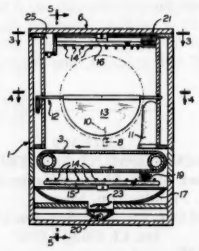
ANIMAL LITTER DISPOSAL UNIT

George Breau, RFD 1, Rumford, Maine 04276

Filed Feb. 1, 1974, Ser. No. 438,947

Int. Cl. A01k *29/00*

U.S. Cl. 119—1 **3 Claims**



1. An animal litter disposal unit comprising in combination:

a. a housing;

b. means for ingress and egress for an animal;

c. support means comprising an endless belt positioned in a substantially horizontal manner at the lower portion of said housing for use by said animal during a period when said animal litters;

d. means for cleansing at least a portion of said support means and at least a portion of said housing;

e. means for activating said cleansing means when said animal exits from said unit;

f. means for removal of said litter and cleansing material from said unit; and

g. said removal means including means for segmenting said litter into substantially small particles of waste.

3,871,332

APPARATUS FOR SUCKING UP AND TRANSFERRING FISHES

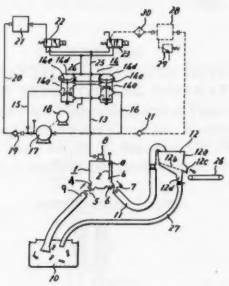
Takeshi Hayashi, Naruto, Japan, assignor to Kyoei Zoki Kabushiki Kaisha, Naruto, Tokushima Pref., Japan

Filed Oct. 19, 1973, Ser. No. 407,821

Claims priority, application Japan, Oct. 28, 1972, 47-108253; Oct. 28, 1972, 47-108254; May 9, 1973, 48-52014

Int. Cl. A01k *63/02*

U.S. Cl. 119—3 **10 Claims**



1. An apparatus for sucking up and transferring fishes comprising a hermetically closed tank provided at its upper portion with air opening means for extracting air therefrom and supplying air thereto and provided at its lower portion with a fish water suction opening connected to a fish water suction pipe and fish transfer and water delivery opening means connected to fish transfer and water delivery pipe means, and an air supplying means connected to said air opening means, a fish water separator for separating the fish water sucked up into the closed tank into fishes and water, control means for alternately changing over the air extracting means and the air supplying means and starting and stopping these means, and a control valve means for (1) communicating the fish water suction pipe with the closed tank and closing the fish transfer pipe means during the air extracting step and (2) closing the fish water suction pipe and communicating the fish transfer pipe means with the closed tank during the air supplying step.

3,871,333

CULTURING OF PEARLS

Hideyuki Gotoh, 405, Shioya 1, Otaru-shi, Japan

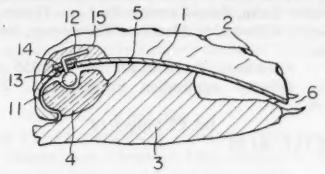
Filed Apr. 15, 1974, Ser. No. 460,697

Int. Cl. A01k *61/00*

U.S. Cl. 119—4 **8 Claims**

1. A method of culturing pearls in abalones, comprising the steps of: perforating a round hole through the shell of an abalone at its portion corresponding to the location of the reproductive organ of the abalone, inserting through said hole of the shell and depositing on the prescribed position on or within said reproductive organ a pearl nucleus, closing the hole of the shell and fixing the location of said pearl nucleus,

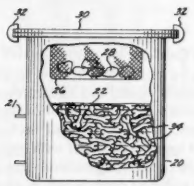
raising the thus treated abalone for a sufficient period of time to let the nacreous concretion formed about the nucleus sufficiently grow within the body of the abalone, and taking out the nucleus coated with the nacreous substance from the abalone.



3,871,334
PET TOY

Herbert R. Axelrod, 211 W. Sylvania Ave., Neptune, N.J. 07753

Filed Dec. 3, 1973, Ser. No. 421,260
Int. Cl. A01k *29/00*
U.S. Cl. 119—29.5 **9 Claims**



1. A method for the manufacture of a chewing toy and the like for animal pets which comprises:

a. forming a toy item in the shape of a bone and the like from a Nylon molding resin having a water absorbency from 0.5 to about 5 weight percent.

b. dissolving meat odors and flavors in an aqueous impregnating solution while maintaining said solution free of suspended solid and fat materials by subjecting meat or animal by-products to steam at a temperature from 210° to about 280° F. and autogenous pressure for a period from 3 to about 20 hours while in the presence of, but out of contact with, water; and

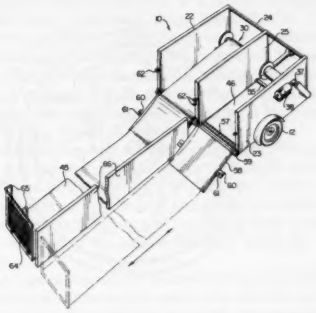
c. immersing said toy item in said aqueous impregnating solution and maintaining it therein for a period of time from 3 to about 20 hours at a temperature from 210° to about 280° F. autogenous pressure.

3,871,335
PORTABLE APPARATUS FOR REMOVING POULTRY FROM A POULTRY HOUSE

Ambrose G. Johnston, Rt. 2, Box 247-A; Guy W. Howard, P.O. Box 12, and William W. Bradshaw, Jr., P.O. Box 45, all of Rose Hill, N.C. 28458

Filed June 7, 1974, Ser. No. 477,225
Int. Cl. A01k *29/00*
U.S. Cl. 119—82 **7 Claims**

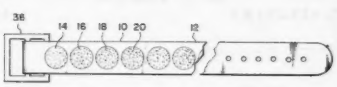
1. A portable apparatus for removing live poultry from a poultry house having a floor comprising a vehicle having a frame, at least two upright side walls mounted on said frame and extending longitudinally thereof, a drive shaft rotatably mounted on said vehicle, means for driving said shaft, at least one reel freely rotatably mounted on said shaft between said walls, conveyor belt means normally carried by said reel but capable of being partially pulled therefrom and extended into the poultry house, said conveyor belt means resting on the floor of the poultry house when extended, clutch means selectively connecting said reel to said drive shaft to drive said reel in one direction, a floor movably mounted on said frame, and resilient cushioning means engaging said floor to urge said floor upwardly and maintain the floor substantially in tangential alignment with the upper portion of said reel under normal load conditions, whereby when said conveyor belt is extended into a poultry house, poultry are herded onto the belt means and thereafter the clutch means is operated to cause the reel to rotate and wind the conveyor belt means thereon while discharging poultry from the vehicle.



3,871,336
REFLECTIVE ANIMAL COLLAR AND LEASH

Samuel Bergman, Brooklyn, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,967
Int. Cl. A01k *27/00*
U.S. Cl. 119—106 **5 Claims**



1. A reflective animal collar and leash, comprising, in combination, a collar-encircling, flexible, base member, releasable fastener means at the ends of said member; a plurality of shaped, light-reflective elements of different colors secured to said member; a clear laminate mounted over said elements and said member; a leash attached to said member and consisting of a plurality of interconnected, light-reflective links.

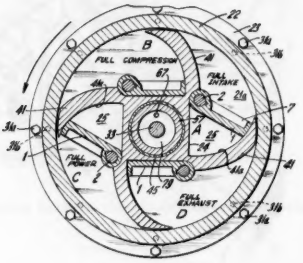
3,871,337
ROTATING CYLINDER INTERNAL COMBUSTION ENGINE

Edward Howard Green, and Edward Howard Green, Jr., both of 57 Interstate Rd., Addison, Ill. 60101

Filed Sept. 5, 1972, Ser. No. 286,294
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.47 **12 Claims**

1. A rotary internal combustion engine comprising, a stationary engine body having a fixed end wall, a rotary engine body supported by the stationary engine body and including an inner wall surface, at least one combustion chamber within one of the engine bodies, the inner wall surface of the rotary engine body and the fixed end wall of the stationary engine body defining walls of the combustion chamber, oscillating means movable in said combustion chamber, a shaft fixedly connected to said oscillating means and operably connected to said rotary engine body, planetary gear means, and linking means interconnecting said planetary gear means and said shaft to transmit through said shaft, during the combustion power cycle, the oscillatory motion of said oscillating means

and to convert said oscillatory motion to rotary motion of the planetary gear means, both the planetary gear means and the



linking means being disposed adjacent only one side of the combustion chamber.

3,871,338

METHOD AND APPARATUS TO REDUCE NOXIOUS COMPONENTS IN THE EXHAUST EMISSIONS OF INTERNAL COMBUSTION ENGINES

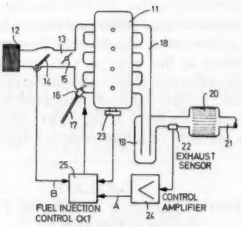
Peter Schmidt; Harald Kizler, both of Schwieberdingen, and Gerhard Hartmann, Hofingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 20, 1973, Ser. No. 390,013

Claims priority, application Germany, Sept. 28, 1972, 2247656

Int. Cl. F02b *3/00*

U.S. Cl. 123—32 EA **10 Claims**



1. Method to reduce the noxious components in the exhaust emission of internal combustion engines having an air-fuel proportion adjustment means, and including an integrating controller carrying out the step of regulating the mass-ratio of air and fuel being applied to the internal combustion engine, utilizing the steps of

sensing the composition of exhaust emission and deriving a sensing signal;

integrating the sensing signal and deriving a fuel-air ratio control signal;

sensing an operating parameter, or condition of the engine; and wherein the improvement comprises the steps of

changing the control range of the control of air-fuel proportion as a function of change of the sensed operating parameter beyond a predetermined limit.

3,871,339

METHOD OF MAKING A COOLED VALVE FOR HEAT ENGINE AND VALVE OBTAINED THEREBY

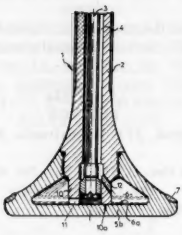
Karl Walter Kuhn, Saint-Germain-En-Laye, France, assignor to Societe d'Etudes de Machines Thermiques, Saint-Denis, France

Filed Sept. 20, 1972, Ser. No. 290,535

Claims priority, application France, Oct. 27, 1971, 71.38596

Int. Cl. F01p *3/14*

U.S. Cl. 123—41.41 **2 Claims**



1. A built-up fluid-cooled poppet valve member construction comprising: a one-piece hollow mushroom head and a stem of substantially round rod-like configuration throughout its length connected in sealing relationship to and projecting endwise from said head; said head including on one side a substantially flat end wall coaxial with and extending substantially transversely of the longitudinal axis of said stem and on the other side a reduced central hub portion coaxial with said stem and terminating in a substantially flat end face parallel to and of smaller extent than said end wall; said head having an inner chamber closed by said end wall and having a threaded bore located opposite to said end wall in coaxial relation with said stem and extending through said hub portion to open into said chamber and to the outside, respectively; said stem having near one end thereof towards said head a peripheral, annular, radially outward projecting flange-like shoulder and an adjacent intermediate threaded section extending from said shoulder towards said one end over a length corresponding substantially to the axial length of said threaded bore; said stem terminating at said one end in a substantially flat transverse end face and also having a coaxial longitudinal bore extending at said one end to and being open at said transverse end face, a tubular pipe element of smaller diameter than said bore and enclosed therein, said element being substantially co-extensive with and disposed in radially spaced relationship with respect to said longitudinal bore thereby defining a pair of cooling fluid conveying concentric ducts, one of which is annular, said pipe element ending recessed axially from adjacent to and being secured directly in sealing relationship to said one end of said longitudinal bore to close off the annular one of said concentric ducts while opening endwise into said one end of said longitudinal bore; said stem extending in screw-threaded engaging relationship through said threaded bore of said hub portion to project bodily into said chamber with said one end abutting endwise with its said flat end face with axially directed thrust pressure contact against said end wall of said head for supporting and backing the latter, and thereby defining an annular cavity within said chamber, said shoulder then bearing against said end face of said hub portion; said stem having adjacent said one end thereof a first port-like passageway providing communication between said chamber and said annular duct and having a second port-like passageway providing direct communication between said chamber and said tubular pipe element via the open end of said longitudinal bore, thereby respectively defining a fluid feed duct and a fluid return duct; at least one of said head and stem having groove means adjacent to said shoulder and the

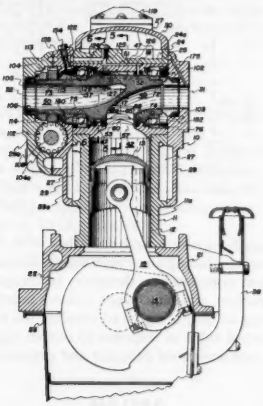
corresponding end of said threaded bore; brazing solder material tightly locking said head and stem together, said brazing-solder material filling all the interstices of junctions between said head and stem and in particular in said groove means and any clearance gaps left between the intermeshing threads of said head and stem, thereby bonding the latter to each other and sealing off the connections therebetween.

3,871,340

ROTARY VALVE INTERNAL COMBUSTION ENGINE

Merritt A. Zimmerman, Cleveland, Ohio, assignor to Tetrahedron Associates, Incorporated, San Diego, Calif.

Filed Oct. 3, 1972, Ser. No. 294,573
Int. Cl. F011 *7/16*
U.S. Cl. 123—80 BA **28 Claims**



1. In a internal combusion engine:
an engine body having a cylinder and valve casing means providing a valve bore extending transversely of the cylinder and connected with one end of the latter;
a piston operable in said cylinder;
antifriction bearings mounted in said casing means and spaced apart axially thereof;
sleeve means disposed in said casing means and extending axially thereof between said bearings;
port means in the walls of said casing means and sleeve means and connected with said cylinder;
a rotary valve supported by said bearings for operation in said sleeve means and controlling the communication with said cylinder through said port means;
said sleeve means being flexible and having beveled end portions; and
contracting means engaging said end portions for contracting said sleeve means around said valve.

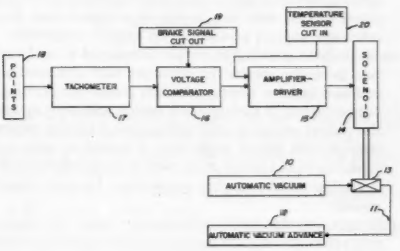
3,871,341

SPEED CONTROLLED IGNITION RETARDER

Thomas A. Kalogerson, Bloomington, Minn., and Joseph E. Dandois, Montoursville, Pa., assignors to Optimizer Control Corporation, Edina, Minn.

Continuation of Ser. No. 100,081, Dec. 21, 1970, abandoned.
This application Mar. 3, 1972, Ser. No. 231,766
Int. Cl. F02p *5/04*
U.S. Cl. 123—117 R **5 Claims**

1. An ignition retarding device for ready attachment to and modification of an automotive vehicle having a multicylinder internal combustion engine for propelling the vehicle, in which the internal combustion engine has an ignition device for each cylinder, a battery, voltage pulse producing means connected to said battery and including a distributor and distributor points driven by the engine and effective to cause opening and closing of said distributor points by operation of said engine to produce high voltage igntion pulses of a frequency dependent upon the speed of said engine, said distributor being effective to apply the high voltage pulses to the ignition devices for the cylinders in a timed relation to the engine cycle, said distributor being adjustable to vary the ignition timing, means including a fluid motor for adjusting the ignition timing, and means including a conduit between said fluid motor and the intake manifold of the engine for normally causing said motor to adjust the distributor to advance the timing as the vacuum in said intake manifold increases; said ignition retarding device comprising:
an electrically operated valve having coupling members of a size and type for quick coupling with said conduit so as to facilitate insertion of the valve into the conduit conection between the motor and the intake manifold of the engine to prevent advance of the timing from an increase in the vacuum in the intake manifold when the valve is closed;
electronic speed responsive means having input terminals for electrical connection to said points and effective when so connected to produce at its output an electrical effect dependent upon the frequency of such high voltage ignition pulses and hence upon the speed of the engine;
control means for said electrically operated valve connected to the output of the speed responsive means inde-

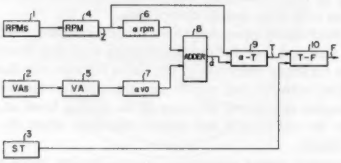


pendently of the load on the engine and effective when the engine speed drops below a predetermined value as sensed by said speed responsive means and independently of the engine load to affect the energization of said electrically operated valve to cause closure of the same to interrupt the connection between the fluid motor and the intake manifold to prevent advance of the timing from an increase in the vacuum in the intake manifold as long as said speed remains below said predetermined value, unless the engine temperature rises above a predetermined undesirable value;
further means connected to said control means for controlling the same and for causing the same to affect the energization of said valve to cause opening of the same to restore the connection between the fluid motor and the intake manifold regardless of the speed of the engine whenever the engine temperature rises above a predetermined value;
and means for connection to the battery of the automotive vehicle for deriving from said battery a source of power for energizing said speed control means and said control means for said valve, the electronic components of the electronic speed responsive device being semiconductors requiring the application thereto of voltages no greater than that of the battery of the automotive vehicle so that the source of power derived from the connection to the battery employs no voltage increasing means.

3,871,342
ELECTRONIC IGNITION TIMING CONTROL CIRCUIT FOR INTERNAL COMBUSTION ENGINE

Hiroshi Fujinami, Okazaki, and Katuyuki Takagi, Ichinomiya, both of Japan, assignors to Nippon Soken, Inc., Nishio-shi, Aichi-ken, Japan

Filed Feb. 26, 1974, Ser. No. 445,902
Claims priority, application Japan, Feb. 27, 1973, 23916/73
Int. Cl. F02p *5/08*
U.S. Cl. 123—117 R **4 Claims**



1. An electronic ignition timing control system for an internal combustion engine comprising:

engine operating condition detecting means including at least revolution detecting means for detecting the number of revolutions of the engine and producing an electrical output signal which varies as a function of speed of revolution;

ignition timing selection means for reading out from a predetermined ignition timing characteristic program an ignition timing characteristic corresponding to the output signal of said detecting means as a retard angle from a reference angular position of an engine crankshaft;

an angle-time conversion circuit connected to said revolution detecting means for receiving said electrical signal and said ignition timing selection means for dividing the output signal of said ignition timing selection means by the output signal of said revolution detecting means to convert said retard angle into a period of time corresponding to the speed of revolution at the moment of the detection of the engine revolutions by said detecting means;

reference angular position detecting means for detecting said reference angular position of said engine crankshaft; and

timer means connected to said angle-time conversion circuit and said reference angular position detecting means for generating an ignition signal when said crankshaft has rotated from said reference angular position for the duration of said time period obtained from said angle-time conversion means.

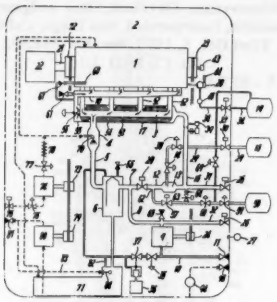
3,871,343
RECYCLE ENGINE APPARATUS

Masashi Nagai; Kazuhito Miwa; Masakazu Tsunetsugu, and Tadamaro Fujiwara, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 347,885, April 4, 1973,. This application July 17, 1974, Ser. No. 489,094
Claims priority, application Japan, Apr. 14, 1972, 47-37592; Apr. 14, 1972, 47-37593; Aug. 21, 1972, 47-83502; Aug. 21, 1972, 47-83503; Aug. 21, 1972, 47-83505
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 A **17 Claims**

1. Apparatus for operating an engine having a gas intake, an exhaust gas outlet and a working gas recycling system connected between said intake and said outlet, said apparatus comprising:

means for controlling the volume of exhaust gas recycled to the engine intake in said recycling system including a compressor having an inlet connected to said recycling system and an outlet, the compressor being capable of compressing exhaust gas at a rate in excess of the full load exhaust volume less the full load intake volume of the engine, a return connection from the compressor outlet to the recycling system, and means including a control valve in the return connection for returning a portion of the compressed exhaust gas to the recycling system to maintain the working gas pressure at a constant value and for discharging the remainder of the compressed exhaust gas from the apparatus;

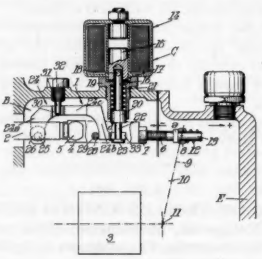


oxygen supply means communicating with the recycling system and including an oxygen supply flow control valve, an oxygen concentation detector, an oxygen concentration presetter, and, an oxygen volume control means for producing an output signal to regulate the oxygen supply flow control valve in response to output signals from the oxygen concentration detector and presetter.

3,871,344
DEVICE FOR LIMITING THE DELIVERY PER REVOLUTION OF AN INJECTION PUMP

Jean Pigeroulet, Villeurbanne, and Andre Brunel, Oullins, both of France, assignors to Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A., Venissieux, France

Filed July 16, 1973, Ser. No. 379,227
Claims priority, application France, July 26, 1972, 72.26891
Int. Cl. F02m *59/42*
U.S. Cl. 123—139 ST **5 Claims**



1. In a fuel injection pump for an internal combustion engine, in which pump there is provided an adjusting rack member for adjusting the delivery per revolution, controlled by a regulator which is driven by the engine supplied by the pump, a device for limiting the delivery of the pump per revolution comprising: retractable stop means for selectively limiting the stroke of said adjusting rack member so that the delivery per revolution does not exceed a full load value, said retractable stop means comprising an articulated member pivotably mov-

able between limiting and nonlimiting positions, said articulated member having two ends, one of these ends being pivotally mounted on an articulation, means for adjusting the position of said articulation along the direction of said rack member, said articulated member having a portion forming a stop abutment for the rack member when the articulated member is in its limiting position; automatic control means for the selective retraction of said stop means to the nonlimiting position on the starting of the engine, to enable the delivery per revolution to assume values greater than that of full load, said control means having an axis situated substantially in the plane of movement of the articulated member; said control means including a linking means between a movable element of said control means and a portion of said articulated member, said linking means allowing a limited degree of free angular movement of the articulated member relative to the movable element; and guiding means to keep the articulated member in a plane parallel to the axis of the control means and to the axis of the rack member.

3,871,345
FUEL INJECTION PUMP WITH IMPROVED RETURN FLOW CONDUIT

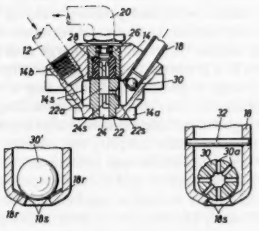
Ernst Hatz, and Erhard Oertel, both of Ruhstorf, Germany, assignors to Motorenfabrik Hatz KG, Ruhstorf, Germany

Filed Aug. 7, 1973, Ser. No. 386,283

Claims priority, application Germany, Aug. 16, 1972, 2240123; Apr. 4, 1973, 2316687

Int. Cl. F02m *59/44*

U.S. Cl. 123—139 AF **10 Claims**



1. In an injection internal combustion engine with at least one fuel injection pump, wherein the fuel passes by gravity flow from a supply container through an admission conduit to a suction chamber of the injection pump, the improvement comprising at least one return flow conduit separate from the admission conduit for superfluous fuel which has not been injected, said return flow conduit leading from the suction chamber of the injection pump to the supply container, and valve means for controlling flow through said return flow conduit to the supply container, said valve means allowing even in its seated position a small flow of fuel such that at least a small flow of fuel is feasible between the return flow conduit and the suction chamber of the injection pump in each operational stage of the injection pump.

3,871,346
DEVICE FOR CONTROLLING THE DELIVERY PER REVOLUTION OF AN INTERNAL COMBUSTION ENGINE INJECTION PUMP

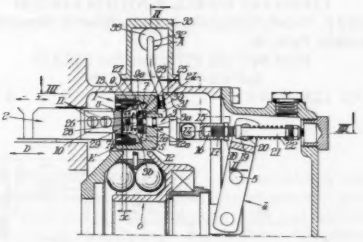
Andre Vuaille, Lyon, France, assignor to Societe Industrielle Generale de Mechanique Appliquee S.I.G.M.A., Venissieux, France

Filed Aug. 21, 1972, Ser. No. 282,146

Claims priority, application France, Aug. 30, 1971, 71.31349

Int. Cl. F02d *1/04, 1/06*

U.S. Cl. 123—140 FG **4 Claims**



1. A device for controlling the delivery per revolution of an internal combustion engine injection pump, including:

a regulating member operatively connected to the pump to adjust the delivery per revolution thereof;

a control member movable to indicate required adjustments of the delivery of the pump;

connecting means operatively connecting said regulating member to said control member;

envelope means in said connecting means, said envelope means being connected to one of said regulating and control members and defining a chamber which extends in the direction of movement of said regulating member;

closure means in said connecting means movable relative to said envelope means, said closure means being connected to the other of said regulating and control members and extending transversely of the direction of movement of said regulating member;

admission means connected to said envelope means to apply a fluid at a variable pressure to the chamber of the envelope means;

wherein the improvement comprises:

said closure means being arranged to separate the chamber of said envelope means into two chamber parts which are isolated from one another in fluid-tight manner;

said admission means being in communication with one of the chamber parts of the envelope means;

resilient return means disposed in the other of the chamber parts of said envelope means between said closure means and said envelope means and acting against the fluid pressure in the one chamber part of the envelope means; and

the one of said envelope and closure means connected to the regulating member providing guidance of the control member and of the other of said envelope and closure means connected to the control member,

said closure means comprising a flexible diaphragm,

the central part of said diaphragm being rigidly connected to said other of said regulating and control member, and

the periphery of said diaphragm being secured to said envelope means,

said regulating member comprising a rod arranged to slide in its longitudinal direction and having said envelope means mounted at one end thereof;

said envelope means comprising a cover presenting a guide bore, a screwthreaded element screwed into the cover, a cap mounted on said one end of said rod and having its periphery clamped between said cover and said screwthreaded element, and confronting concave faces on said cover and said cap to define the chamber of said envelope means;

said flexible diaphragm being clamped at its periphery between said cap and said cover; and

said control member comprising a lug which extends through said diaphragm and to which the central part of said diaphragm is secured, said lug extending slidably in fluid-tight manner through the guide bore provided in said cover.

3,871,347

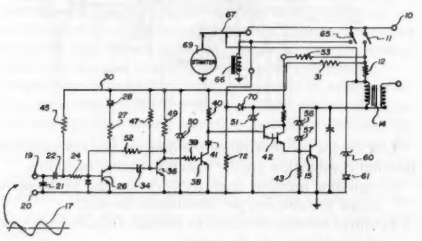
CONSTANT DWELL IGNITION SYSTEM

Howard F. Weber, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 20, 1972, Ser. No. 308,125

Int. Cl. F02p *1/00, 5/04*

U.S. Cl. 123—148 E **4 Claims**



1. An electronic ignition system for alternately charging and collapsing the field in an ignition coil to produce a spark for firing an internal combustion engine, including in combination, first switching circuit means having an input and an output and operable between an on and an off condition, with the output thereof coupled with the ignition coil for alternately charging and collapsing the field in the ignition coil, second switching circuit means having an input and an output and operable between an on and an off condition, control means connected to the input of said second switching circuit means and controlling the same between the on and off condition in direct relation to engine RPM, a capacitor having a first terminal connected with the output of said second switching circuit means and a second terminal connected with the input of said first switching circuit means, a first direct current source connected to one of said first and second terminals of said capacitor, a second direct current source connected to the other of said first and second terminals of said capacitor, said second switching circuit means being operated to one of said on and off conditions by said control means to charge said capacitor through said first direct current source to operate said first switching circuit means to one of said on and off conditions to charge the ignition coil, said second switching circuit means being further operated to the other one of said on and off conditions by said control means to discharge said capacitor through said second direct current source to operate said first switching circuit means to the other one of said on and off conditions to collapse the field in the ignition coil to cause an ignition spark, resistive means coupled from said first switching circuit means to said second switching circuit means to hold said second switching circuit means in said other one of the on and off conditions thereof with said first switching circuit means in said other one of the on and off conditions thereof, and the ratio of current passing through said first direct current source to the current passing through said second direct current source at engine rpm above cranking speed is such that said capacitor charges to an amount less than the total capacity thereof prior to the discharge of the same thereby providing charging of the ignition coil for a constant percent of the total period between ignition sparks, whereas at engine cranking speed, the frequency of operation of said second switching circuit means permits said capacitor to completely charge through said first direct current source to provide a constant off time of the current through the ignition coil at such cranking speed.

3,871,348

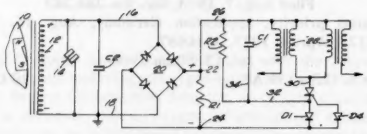
CAPACITIVE DISCHARGE IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

David T. Cavil, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 7, 1973, Ser. No. 330,443

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 E **6 Claims**



1. A capacitive discharge ignition system for internal combustion engines, said system comprising a coil, means for storing energy in said coil, a charge capacitor in circuit with said coil to be charged thereby, breaker points connected across said coil and operative when opened to cause the energy stored in said coil to charge said capacitor, an ignition primary winding in circuit with said charge capacitor, switch means in circuit with said primary winding and said charge capacitor and including a control terminal operative to turn said switch means on so as to discharge said charge capacitor in response to a predetermined trigger voltage, a circuit shunting said charge capacitor and including a resistance and a second capacitor, whereby the charge buildup on said second capacitor lags the buildup on said charge capacitor by the time constant of said shunt circuit, the voltage on said second capacitor being applied to said control terminal and the values of said resistance and of said second capacitor being selected so that said trigger voltage is applied to said control terminal at approximately the time of maximum charge on said charge capacitor.

3. A capacitive discharge ignition system in accordance with claim **1** wherein the values of said resistance and of said second capacitor being selected so that the breakdown voltage of said control terminal occurs when the voltage on said second capacitor is less than the voltage on said charge capacitor.

3,871,349

RFI SUPPRESSION SPARK PLUG

James R. Hager, both of Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

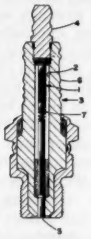
Filed Jan. 12, 1973, Ser. No. 323,089

Int. Cl. F02p *1/00*

U.S. Cl. 123—169 EL **10 Claims**

1. A spark plug for suppressing radio frequency interference and having particular application utility in an ignition system of the capacitor-discharge type, said spark plug comprising; an outer body, an insulator attached to said body and a center electrode assembly disposed within said insulator, said center

electrode assembly including in electrical series therewith an inductor element having a minimum resistance, said inductor



element being of wound wire having relatively high electrical conductivity and substantially enclosed within said insulator.

3,871,350

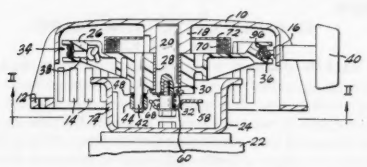
RECOIL STARTER

Lyle J. Hamman, Eaton Rapids, Mich., assignor to Eaton Stamping Company, Eaton Rapids, Mich.

Division of Ser. No. 167,216, July 29, 1971, Pat. No. 3,782,355. This application Aug. 2, 1973, Ser. No. 385,318

Int. Cl. F02n *1/00*

U.S. Cl. 123—185 A **3 Claims**



1. A recoil starter for internal combustion engines comprising, in combination, a housing, pulley bearing means mounted upon said housing, a starter rope pulley rotatably mounted on said bearing means, said pulley having a starter rope receiving groove defined therein, said groove being defined by first and second radially extending sides and a base surface, recoil spring means operatively interposed between said housing and said pulley adapted to rotate said pulley in a rope recoiling direction, an opening defined in said pulley intersecting said groove adjacent said base surface, a starter rope adapted to be coiled in said pulley groove having an inner end inserted through said opening and attached to said pulley and an outer end, said groove having an axial width as defined by said first and second sides substantially twice the diameter of said starter rope, an annular shoulder defined in said groove adjacent one of said sides and radially spaced outwardly from said base surface and of an axial width substantially corresponding to the rope diameter, the difference in radii between said shoulder and said base surface being less than the diameter of said rope, whereby the first coil of rope rewound on said pulley, the pulley side adjacent said shoulder and said shoulder define an annular recess for receiving the second coil of rope wound on said pulley, a rope bushing mounted in said housing having a guide bore, a handle affixed to said rope outer end exteriorly located with respect to said housing, clutch means mounted on said pulley selectively engageable with engine drive means, and rope guiding means defined on said groove base surface adjacent said opening and ahead of said opening with respect to the rotation of said pulley in a rope recoiling direction deflecting the rope during recoiling away from said opening and rope inner end extending therein into said annular recess to prevent the second coil of rope received within said groove during recoiling from laying upon the first rope coil recoiled in said groove.

3,871,351

CYLINDER ARRANGEMENT HAVING A COMBUSTION AND A PRECOMBUSTION CHAMBER THEREIN AND A SEPARATE FUEL SUPPLY OR DOSING MEANS THEREFOR

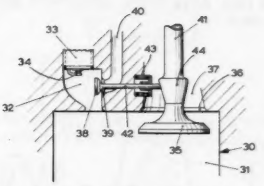
Istvan Geiger, and Gerd Decker, Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Division of Ser. No. 161,629, July 12, 1971,. This application July 9, 1973, Ser. No. 377,403

Claims priority, application Germany, July 31, 1970, 2038097

Int. Cl. F02b *19/00*

U.S. Cl. 123—32 SP **3 Claims**



1. In a combustion engine for motor vehicles, a cylinder arrangement comprising a combustion chamber, a precombustion chamber in communication with said combustion chamber, spark-plug means having electrodes in communication with said precombustion chamber, a first fuel supply or dosing means associated with said combustion chamber and a second fuel supply or dosing means associated with said precombustion chamber, said first fuel supply or dosing means comprising a member having a stem operable for assuming different predetermined axial positions representative of the operating states of the first fuel supply or dosing means, said stem including a portion having cross sectional profiling formed as a cam, and operating means associated with both said member and said second fuel supply or dosing means, said operating means comprising a spring means and an operating bar slidably mounted against the force of said spring means transversely with respect to said stem, said cam being operatively coupled to said bar, said bar being operatively coupled to said second fuel supply or dosing means.

3,871,352

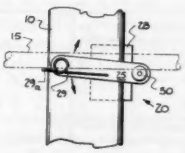
ARROW REST ACCESSORY FOR ARCHERY BOW

Melvern B. Stanislawski, 7135 S.E. Cora, Portland, Oreg. 97206, and Daniel F. McKinney, 1427 Coquette St., Medford, Oreg. 97501

Filed Feb. 4, 1974, Ser. No. 439,028

Int. Cl. F41b *5/00*

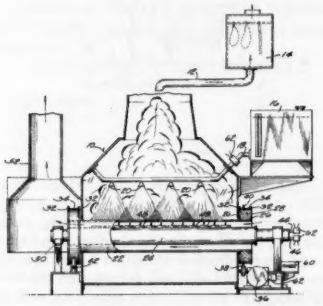
U.S. Cl. 124—41 A **3 Claims**



1. An arrow rest accessory, adapted for mounting on a handle riser portion of an archery bow for absorbing the shock

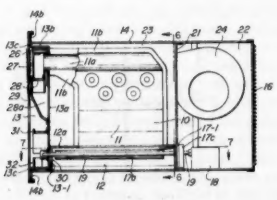
imparted to a bow following release of an arrow, comprising:
a. mounting means adapted to releasably secure said accessory to a handle riser portion of a bow;
b. a cantilevered resilient arm member secured at its fixed end to said mounting means; and
c. a helically wound resilient spring member affixed at one end to the free end of said cantilevered arm member and projecting substantially horizontally from a handle riser portion of a bow and in a direction transverse to that of an in-place arrow, the end of said spring member being substantially straight and providing vertical support of an arrow and the coiled portion of the spring member provides a lateral support for an arrow.

3,871,353
SMOKE GENERATOR USING LIQUID SMOKE
Thomas J. Haug, 2214 Franklin St., Manitowoc, Wis. 54220
Filed Nov. 15, 1973, Ser. No. 416,299
Int. Cl. A23b *1/04;* **A01g** *13/06;* **A47j** *36/38;* **B01d** *50/00*
U.S. Cl. 126—59.5 **12 Claims**



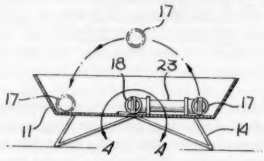
1. In a smoke generator for producing gaseous smoke from liquid smoke concentrate, the improvement comprising: a drum having a metallic surface supported for rotation on an axis, means for supplying liquid smoke concentrate to a restricted portion of said metallic surface, means for rotating said surface, and stationary heating means for heating said surface, whereby to convert said liquid smoke to gaseous smoke and to reduce accumulation of residues on said surface.

3,871,354
SEALED COMBUSTION CHAMBER NATURAL DRAFT, OUTSIDE WALL FURNACE
George W. Jackson, Salt Lake City; Dennis N. Dacey, Riverton, and Paul W. Jackson, Granger, all of Utah, assignors to Hydro Flame Corporation, Salt Lake City, Utah
Filed Jan. 7, 1974, Ser. No. 431,474
Int. Cl. F24h *3/00;* **F23j** *11/00*
U.S. Cl. 126—110 R **10 Claims**



1. A fluid-fuel furnace for mounting through an exterior wall of an enclosure to be heated, comprising a housing having a vented end adapted for exposure to the atmosphere; wall means internally of said housing providing a vent chamber at said vented end and a heated exchange compartment next to the vent chamber and closed off from air flow communication therewith; heat exchange structure within the heat exchange compartment and defining internally thereof one or more lower combustion chambers opening into one or more upper exhaust flues for gaseous products of combustion, said flues opening into the upper part of the vent chamber through said wall means; additional wall means below the heat exchange structure and defining a burner chamber opening into said one or more combustion chambers and having a draft-opening through the first-named wall means into the vent chamber; a fluid-fuel burner within the burner chamber; baffle means within the vent chamber comprising a downwardly and inwardly sloping air scoop baffle plate positioned between the flue openings in the vent chamber and said draft opening; a face plate providing said vented end of the housing, said face plate having exhaust vents formed through an upper section thereof above said baffle plate, and additionally having ports formed through a lower section thereof that is spaced below said upper section, to provide outside draft air for said burner; means for supplying said burner with a fluid fuel; and means for flowing air from within said enclosure into, through, and out of said heat exchange compartment.

3,871,355
GAS DISTRIBUTION APPARATUS FOR ARTIFICIAL LOGS
Donald L. Henry, 12208 Park Ave., Santa Fe Springs, Calif. 90670
Filed Mar. 23, 1973, Ser. No. 344,355
Int. Cl. F24c *3/04;* **F24b** *1/18*
U.S. Cl. 126—127 **1 Claim**



1. A natural gas or propane distribution apparatus for use in connection with producing flames about an arrangement of artificial logs resting in a firebed above the distribution apparatus, the combination comprising:
a pan having a bottom and a continuous sidewall extending about the peripheral edge of said bottom so as to define a firebed area between the opposing inner wall surfaces;
a gas distribution assembly disposed in said firebed area having one end thereof supported on said bottom and its opposite end supported on said sidewall so that gas distribution assembly is raised above said bottom;
said gas distribution assembly including at least a pair of tubes closed at their ends supported on said bottom and arranged in parallel, fixed spaced apart relationship to produce an irregular, asymmetrical flame pattern and operably coupled at their opposite ends to a source of pressurized natural gas or propane, each of said tubes having at least one row of holes formed therein along the side portion of each tube providing gas discharge jets directed at an opposing surface of said sidewall;
means for anchoring a selected one of said pair of tubes to said pan bottom;
the row of said holes associated with one of said tubes are arranged in an array facing the rear of said pan while the other rows of said holes associated with said other tube faces the front of said pan;

said selected one of said pair of tubes lies along the central longitudinal axis of said pan;

the other tube of said pair than said selected one is joined to said gas supply source and said selected tube by a swivel connection so as to rotate from one side of said selected tube to the other side thereof;

said tubes are closed at their respective cantilevered ends; said sidewall extends outwardly and slopes upwardly; and said other tube is coupled to said swivel connection by an elbow joint and a linear conduit.

3,871,356

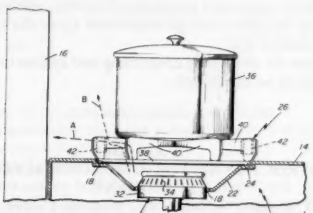
GAS RANGE GRATE

Domenick Saponara, Macungie, Pa., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 3, 1973, Ser. No. 421,012

Int. Cl. F24c *15/10*

U.S. Cl. 126—215 **8 Claims**



1. A gas cooking range having a maintop, at least one burner opening in said maintop adjacent one edge thereof, a burner located within said opening and, having flame ports therein at which flames are normally produced which flames normally create combustion products directed generally laterally in the direction of said edge and onto adjacent structure located adjacent said edge, a grate mounted in said opening over the burner, and comprising a pair of radially extending members, and means carried by said grate at a level above said ports for deflecting said combustion products in a generally upward direction to avoid overheating of said adjacent structure, said means comprising a deflector connected between said members adjacent the outer ends thereof.

3,871,357

SELF-WARMING CONTAINER FOR PRECOOKED FOODS

Vincenzo Grosso, 31 Via Felice Casati, and Attilio Grosso, 1 Via Appiani, both of Milan, Italy

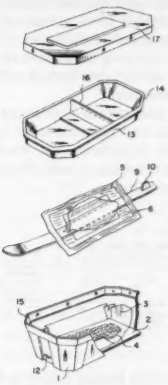
Filed Oct. 10, 1973, Ser. No. 404,928

Claims priority, application Italy, Aug. 3, 1973, 27508/73

Int. Cl. F24j *1/02;* **B65b** *25/22*

U.S. Cl. 126—263 **5 Claims**

1. A self-warming container for precooked foods of the kind operating by means of an exothermic reaction between a chemical reactant and water disposed within the container comprising a closed envelope within the container containing the water, an exothermic hydratable chemical reactant located within the container for contact with the water when the envelope is opened and in an amount sufficient to heat the food when contacted with the water, a cutting blade adapted to open the envelope, a sliding control strip inside the container supporting said cutting blade, a guide for said control strip to move said cutting blade over said envelope, a tongue on said control strip extending outside the container, said guide for the control strip being a sheet adhesively secured to the envelope along two lateral zones leaving an unadhered central zone between the envelope and the guide, said control strip being situated in said central zone to be held in contact with the envelope whereby said control strip may be engaged by its tongue and pulled to move the strip in the central zone



and cause the cutting blade to open the envelope to free the water for contact with the calcium oxide within the container.

3,871,358

GUIDING TUBE FOR THE INSERTION OF AN ADMISSIBLE MEDICAL IMPLEMENT INTO A HUMAN BODY

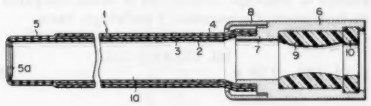
Noboru Fukuda, and Yutaka Otani, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 31, 1973, Ser. No. 384,193

Claims priority, application Japan, Aug. 4, 1972, 47-91216; Aug. 4, 1972, 47-91217

Int. Cl. A61b *1/00*

U.S. Cl. 128—2 M **7 Claims**



1. A guiding tube for the insertion of an admissible medical implement into a human body which comprises a tube member consisting of an innermost tube unit having a passageway formed therein through which to conduct an admissible medical implement, a flexible core tube unit concentrically surrounding the innermost tube unit in close contact, an outermost tube unit concentrically surrounding the flexible core tube unit and a pliable forward end portion open at the forward end; and an inlet member fitted to the inlet of the tube member.

3,871,359

IMPEDANCE MEASURING SYSTEM

Allan F. Pacela, Diamond Bar, Calif., assignor to Interscience Technology Corporation, City of Industry, Calif.

Filed June 25, 1973, Ser. No. 373,435

Int. Cl. A61b *5/05*

U.S. Cl. 128—2.1 Z **7 Claims**

1. Impedance measuring apparatus for measuring first and second electrical impedances, comprising:

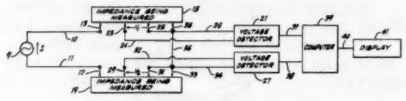
current source means for producing an alternating current of constant magnitude;

first and second voltage detector means for measuring voltages;

first electrode pair means attached to said current source means and adapted to be connected between the first and second electrical impedances;

second electrode pair means electrically connected together and adapted to be connected between said first and second electrical impedances to complete an electrical circuit comprising said current source means connected to the series combination of said first and second electrical impedances;

third electrode pair means connected to the first voltage detector means and adapted to be connected across the first electrical impedance for measuring the voltage thereacross in response to said alternating current of said current source means;



fourth electrode pair means connected to the second voltage detector means and adapted to be connected across said second electrical impedance for measuring the voltage thereacross in response to said alternating current of said current source;

computer means connected to said first and second voltage detector means for computing the ratios of changes in the electrical impedance of said first and second electrical impedances to the steady-state value thereof, respectively; and

display means for displaying said ratios computed by said computer means.

3,871,360

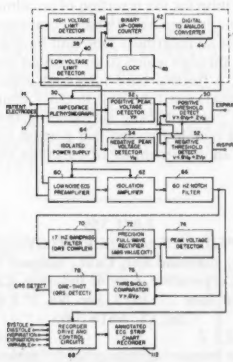
TIMING BIOLOGICAL IMAGING, MEASURING, AND THERAPEUTIC TIMING SYSTEMS

Joseph M. Van Horn, Cambridge; Paul Epstein, Brookline, and Patrick G. Phillipps, Newton, all of Mass., assignors to Bratle Instrument Corporation, Cambridge, Mass.

Filed July 30, 1973, Ser. No. 383,707

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 R **29 Claims**



28. A system for timing biological imaging, measuring or therapeutic apparatus in accordance with selected physiological states of a subject, comprising

input circuitry means for providing electrical signals representative of a physiological cycle of said subject,

output circuitry means effectively connected to said input circuitry means for providing a succession of timing signals at selected portions of said physiological cycles, and digital offset correction circuitry means effectively connected to said input circuitry means for automatically causing said electrical signals representative of physiological cycles to be within a predetermined range, said correction circuitry means including limit detection means effectively connected to said input circuitry for providing a signal when the physiological signal is outside said range, digital means effectively connected to said detection means for providing digital pulses in the presence of a signal from said detection means, a counter effectively connected to said digital means for counting said pulses, said detection means including upper and lower limit detectors for respectively incrementing and decrementing said counter when the physiological signal is above and below said range, and offset generator means effectively connected to said input circuitry means for generating an offset voltage dependent upon the count in said counter, and

means for effectively connecting said system to said apparatus to be controlled.

3,871,361

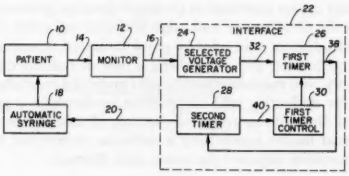
CONTROL DEVICE FOR A MONITOR SUPERVISING A PATIENT

Dean L. Kamen, 99 Bulson Rd., Rockville Centre, N.Y. 11570

Filed Mar. 11, 1974, Ser. No. 449,622

Int. Cl. A61b *05/02;* **A61m** *05/00*

U.S. Cl. 128—2.05 R **8 Claims**

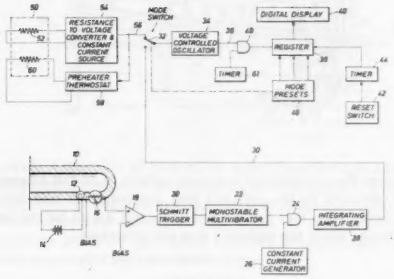


1. In a system including a monitor operatively arranged to supervise the blood pressure and like conditions of a patient and in response to changes in said supervised conditions to operate a medication-administering device for said patient, a control device for said monitor comprising means for generating a selected voltage signal in response to a signl input thereto from said monitor, a first timer electrically connected to continuously receive said selected voltage signal as an input thereto for a time interval necessary to charge a capacitor to the value of said selected voltage, means operated by said first timer when said capacitor thereof achieves said voltage charge to start the operation of said medication-administering device, and a second timer operated simultaneously with said medication-administering device for a selected time interval and effective to prevent any successive operation of said first timer until completion of said selected time interval, whereby an initial medication dosage is delivered to said patient by said medication-administering device only after the lapse of said time interval of said first timer so as to minimize any false indication of an emergency situation and a succeeding dosage is delivered only after the lapse of said time interval of said second timer which is selected in relation to the refractory period for the medication involved.

3,871,362
BODY TEMPERATURE AND HEAT RATE MEASUREMENT SYSTEM

Gerald W. Dunegan, 611 Montclair Blvd., Sugurland, Tex. 77478

Filed Nov. 27, 1973, Ser. No. 419,263
Int. Cl. A61b 5/00
U.S. Cl. 128—2.06F 4 Claims



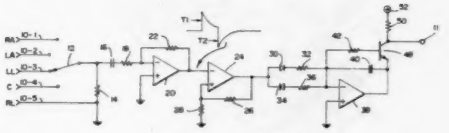
1. A physiological indicating system comprising:
transducer means for engaging a finger of a patient to form optically created pulse signals and
wherein said transducer means includes
a lamp means for transilluminating a finger and
light responsive means for observing a change in the finger on a heart beat;
circuit means for converting the pulse signals into a voltage analogous to the pulse rate, said means comprising
an amplifier connected to said transducer means;
level responsive circuit means connected to said amplifier for forming a pulse on a pulse of the finger so observed;
means for making the pulse so formed uniform in length;
means for summing said pulses so said circuit means can form a voltage analogous to the pulse rate;
a voltage dependent oscillator connected to said circuit means for forming output pulses at least partly proportional to the voltage level;
register means for storing the number of pulses input thereto from said oscillator;
pre-set circuit means connected to said register for providing a pre-set number therein serving as a scale factor so that the number of pulses stored in said register is scaled to the measure of interest;
timing means which gates said register on for a specified interval; and,
digital display means connected to said register means for providing a digital indication.

3,871,363
PACER DIAGNOSTIC INSTRUMENT

Christopher C. Day, Newtonville, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 19, 1973, Ser. No. 426,407
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 R 7 Claims

1. A device interconnected between the source of an EKG signal and an instrument for permanently recording an EKG signal, the device serving to operate upon pacer pulses contained in the EKG signal for converting said pulses to a form suitable for recording by said recording instrument, comprising means for receiving said EKG signal and said pacer pulses, means for substantially attenuating said EKG signal and not said pacer pulses, means for detecting the leading and trailing edges of a pacer pulse, trigger means operative in response to said detector means for providing a rectangular pulse equal in width to said pacer pulse, integrator means operative in response to said trigger means for integrating said rectangular pulse, said integrator means including means for generating both a ramp signal in one direction from the time that said leading edge of said pacer pulse is detected until the time that said trailing edge of said pacer pulse is detected and a second ramp signal in the opposite direction following the detection of said trailing edge, means responsive to said integrator means for generating a wide pulse whose width is a greater-

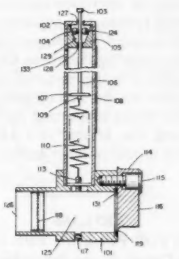


than-unity predetermined multiple of the time interval between said leading edge and said trailing edge, means for controlling the rate of said second ramp signal to be substantially slower than the rate of said first ramp signal by a predetermined factor, means for governing the duration of said wide pulse to be co-extensive with the duration of both of said ramp signals, and means for transmitting said EKG signal and said wide pulse mutually exclusively to said instrument.

3,871,364
PEAK FLOW METER-EXPIRATORY FLOW RATE

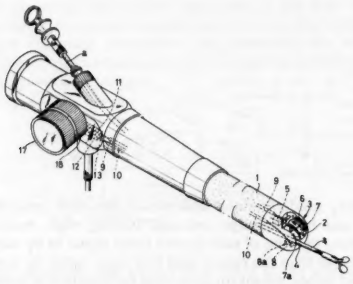
John Randall Boehringer, 427 Parkview Dr., Wynnewood, Pa. 19096

Filed Sept. 24, 1973, Ser. No. 399,816
Int. Cl. A61b 5/08
U.S. Cl. 128—2.08 7 Claims



1. Apparatus for measuring peak air flow comprising:
housing means defining first and second cavities which communicate with one another, said first cavity having an input port and at least one output port and said second cavity having an output port;
mobile piston means located in said second cavity and separating said first and second cavities, said piston means and the walls of the second cavity having a predetermined clearance therebetween, the output port of the second cavity being exclusively on one side of said piston means.
spring means for restricting the motion of said piston means;
indicating means for registering the peak excursion of said piston means, said indicating means including shaft means mobile with said piston means;
and means for locking said shaft means in position of said peak excursion.

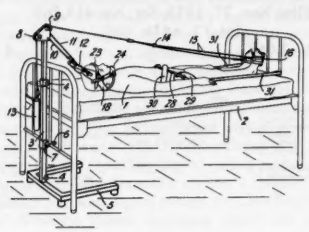
3,871,365
ENDOSCOPE
Toshio Chikama, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan
Filed June 6, 1973, Ser. No. 367,401
Claims priority, application Japan, June 19, 1972, 47-60436
Int. Cl. A61b *1/00*
U.S. Cl. 128—5 **6 Claims**



1. An endoscope comprising a front portion with an observation window, an image-receiving optical system including a turnable member facing said window to view different portions of a visable field outside said window, a forceps projecting through said window, support means guidably supporting said forceps for pivotable meovement, and an operating means coupled to said support means for the forceps and to said turnable member of the optical system selectively to (a) couple said support means and turnable member so that the forceps and turnable member move conjointly and (b) to enable the support means and turnable member to be individually operated to alter the relative position of the forceps and the turnable member of the optical system, said operating means comprising a first operation member for said support means, a second separate operation member for said turnable member of the optical system, two adjacent, coaxial, rotatable control knobs each coupled to a respective operation member, means normally coupling the knobs for common rotation movement but capable of being rendered inoperative to allow separate rotation of the knobs, said means coupling the knobs comprises respective shafts supporting the knobs, and means separably connecting the knobs, said knobs being axially displaceable relative to one another on said shafts to disconnect the knobs.

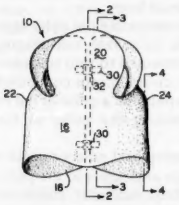
3,871,366
DEVICE FOR PULLING THE RACHIS
Yves Paul Charles Cotrel, 9, rue Perrochaud-F, Berck-Plage, France
Filed Nov. 6, 1973, Ser. No. 413,267
Claims priority, application France, Nov. 8, 1972, 72.39480
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 **1 Claim**

1. Device for pulling the rachis of a patient, which comprises a horizontal support adapted to hold said patient in a lying position, removable attaching means adapted to engage on the one hand the pelvic area of said patient and on the other hand one end of said horizontal support to prevent said patient from moving away from said one end, means adapted to engage the occipital area of said patient, and traction means bearing on the other end of said horizontal support and connected to said means adapted to engage the occipital area to pull same towards said other end along an upwards direction with an angle lying between 30° and 60° to the horizontal, said traction means comprising a removable bracket adapted to be attached to said other end of said horizontal support, a pulley mounted on the upper portion of said bracket over which is trained a strap connecting said means adapted to engage the occipital area of said patient to a counter-weight, and another pulley mounted on the upper portion of said bracket over which is trained another strap connecting said means adapted



to engage the occipital area of said patient to pedals adapted to be operated by the patient's feet, the length of said other strap being such that the patient will exert a pull on the last said means when the patient's legs are stretched.

3,871,367
PELVIC BRACE
Marion E. Miller, 5918 Camelback, Camelback Ct., Indianapolis, Ind. 46250
Filed Jan. 22, 1974, Ser. No. 435,460
Int. Cl. A61f *5/02*
U.S. Cl. 128—78 **8 Claims**



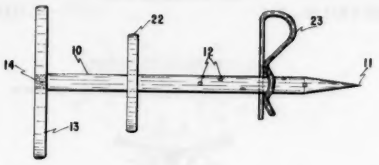
1. A pelvic girdle shaped to engage a person at his pelvis and comprising an outer layer of a hard substantially rigid layer of a plastic material and an inner layer of a soft compressible plastic material bonded to said outer layer, which inner layer has localized areas of varied thickness,

the girdle including anterior and posterior portions and being vertically split in its posterior portion and including releasable fastening means secured to the adjacent posterior portions, the girdle also having a center anterior upper portion adapted to extend up to about the base of the sternum of the wearer and curved outwardly of the girdle, which upper portion is separated at its lateral margins from other anterior portions of the pelvic girdle and is free to flex slightly, the girdle having upper side portions connecting the anterior and posterior portions and including inwardly curved sections adapted to engage the iliac crests and having appreciably thicker compressible inner layers on such sections.

3,871,368
DEVICE FOR FIXATION OF PREPARTURIENT VAGINAL PROLAPSE
Thomas P. Johnson, 605 E. St., Sidney, Iowa 51652, and Wilmer T. van Berkum, 109 W. 10th St., Spencer, Iowa 51301
Filed Oct. 10, 1973, Ser. No. 405,065
Int. Cl. A61f *5/46*
U.S. Cl. 128—127 **5 Claims**

1. A device for fixation of preparturient vaginal prolapse in large animals comprising a pointed body member for insertion

from the interior of the vagina through the walls thereof and tissues exterior thereof, said body member being formed to provide one sharp pointed end, button head means on said body member at the end opposite said pointed end adapted to support said vaginal walls, said body member being formed to



provide a plurality of transverse holes therethrough adjacent said pointed end, washer means removably supported on said body member adapted to engage said exterior tissues, and pin means insertable in one of said holes to hold said washer means in place on said body member between said button head means and said one hole.

3,871,369

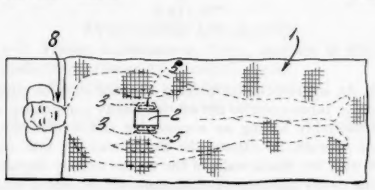
SELF-ADHESIVE SURGICAL APPAREL AND METHOD

Henrietta K. Krzewinski, Old Bridge, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 2, 1973, Ser. No. 384,843

Int. Cl. A61t *13/00*

U.S. Cl. 128—132 D **6 Claims**



1. A self-adhesive surgical drape having a top side adapted to lie facing away from the body of a patient and a bottom side adapted to lie adjacent the body of a patient, said drape having a fenestration opening spaced inwardly from the outer periphery thereof, an interior edge defining said fenestration opening, a foldable flap integral with a portion of said interior edge, and pressure sensitive adhesive on at least part of a surface of said flap and a releasable cover sheet covering said adhesive, said adhesive surface being adapted to lie facing away from the patient during draping and to be folded over to lie adjacent the patient when the fenestration portion of the drape is properly positioned on the patient, whereby to facilitate rapid and sterile draping of a patient.

3,871,370

TONGUE-THRUST CORRECTION APPLIANCE

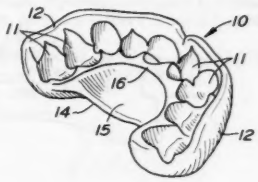
Lee E. McDonald, 1800 Zollinger Rd., Columbus, Ohio 43221

Filed July 5, 1973, Ser. No. 376,558

Int. Cl. A61c *11/00*

U.S. Cl. 128—136 **6 Claims**

1. A tongue-thrust correction appliance comprising a body of molded material having at least two laterally spaced elements, each element therof having an upper surface conformation of elongated, channel-form adapted to interfit with corresponding upper jaw portions in retained relationship therewith and a lower surface adapted to be contactingly engaged by lower jaw teeth, and an integrally formed, thin web extending transversely between said spaced elements, said web having an upper surface which is vertically disposed relative to said spaced elements to be in vertically spaced relationship to the roof of the mouth when the appliance is positioned therein and a transverse rear edge which termiantes no further rearwardly relative to said spaced elements than a line extending transversely thereacross at a point coincident with the position of the second bicuspid teeth when the appliance is positioned in the mouth whereby the tongue may be positioned in overlying relationship to the upper surface of said web.



3,871,371

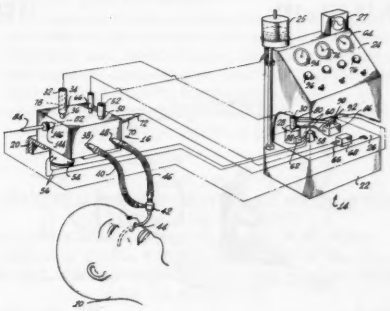
RESPIRATION SUPPLY AND CONTROL

James Weigl, Santa Monica, Calif., assignor to Puritan-Bennett Corporation, Kansas City, Mo.

Filed Dec. 11, 1972, Ser. No. 313,978

Int. Cl. A61m *16/00*

U.S. Cl. 128—145.8 **5 Claims**



1. A respiration supply and control system comprising:

a console provided with a volume generator to supply a desired respiration gas mixture at a selected cycle rate for use by a patient located at a substantial distance from the console;

a transfer unit to receive the gas and transmit it to the patient;

an elongate, large volume, gas supply hose interconnecting the volume generator and the transfer unit;

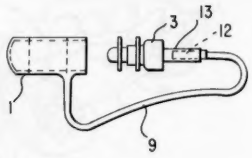
a relatively short, small volume, delivery hose extending from the transfer unit and adapted to be placed in flow communication with the patient;

valve means in the transfer unit to control the flow of gas therefrom to the patient;

an actuator on the transfer unit for the valve means;

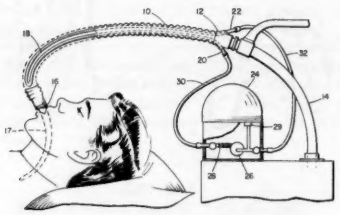
and control means on the console and connected to the actuator to control its operation.

3,871,372
COMBINATION EAR PLUG AND EAR PLUG RETAINER
Jim Bivins, 1906 N. Fourth St., Longview, Tex. 75601
Filed Feb. 19, 1974, Ser. No. 443,909
Int. Cl. A61t *11/02*
U.S. Cl. 128—152 5 Claims



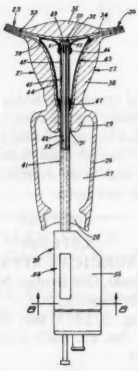
1. An article of manufacture comprising an ear plug, a housing for said ear plug, template receiving elastic means integral with said housing for receiving a template of a pair of eyeglasses, said means including a passage through which can be inserted a template of a pair of eyeglasses for frictional engagement therewith, and flexible means for connecting said ear plug to said housing.

3,871,373
HUMIDIFYING GAS
Richard R. Jackson, Eight Trinity Rd., Marblehead, Mass. 01947
Filed Oct. 30, 1972, Ser. No. 301,773
Int. Cl. A61m *15/00, 15/08*
U.S. Cl. 128—193 15 Claims



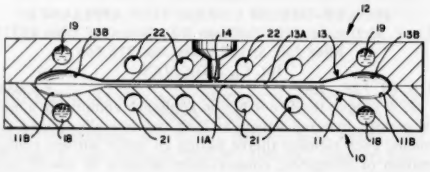
1. Apparatus for humidifying a gas and delivering it to be breathed, comprising
a gas conduit having an inlet for communicating with a source of said gas, and an outlet, for enabling flow of gas along said conduit,
a water chamber coextensive over a zone with a portion of said gas conduit,
said chamber or said conduit having a wall permeable to water vapor at said zone,
means for causing liquid water to flow along said wall in intimate contact with one side thereof at said zone at a vapor pressure sufficient to cause passage of water vapor through said wall and into said conduit to humidify gas therein, said water flow being co-current with said flow of gas along at least a portion of said wall, and
means for delivering the humidified gas to a patient.

3,871,374
DISPENSING INSTRUMENT
Lee R. Bolduc, Minneapolis, and Eugene A. Dickhudt, St. Paul, both of Minn., assignors to Population Research Incorporated, Minneapolis, Minn.
Filed Sept. 6, 1973, Ser. No. 394,727
Int. Cl. A61m *1/00*
U.S. Cl. 128—235 22 Claims



16. An instrument for placing material in both canals of Fallopian tubes open to the uterine cavity comprising: a balloon assembly having an expandable sleeve member, first means operable to expand the sleeve member into engagement with the inside walls of the uterus to fully displace the uterine cavity and then partially contract the sleeve member, second means for discharging material into the uterine cavity between the partially contracted sleeve member and the inside top wall of the uterus, said first means being operable to re-expand the sleeve member to fully displace the uterine cavity whereby the material in the uterine cavity is forced into the canals of the Fallopian tubes by the re-expanding sleeve member.

3,871,375
UNITARY MOLDED SWABS
Robert A. Bennett, Sturbridge Rd., Easton, Conn. 06425
Filed Aug. 30, 1973, Ser. No. 393,074
Int. Cl. 464 *54;* A61m *35/00*
U.S. Cl. 128—269 3 Claims



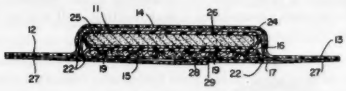
1. A unitary molded polymer foam article formed in the shape of a swab having an elongated dense shaft holding means portion of fine-celled porosity and an enlarged working tip portion of coarse-celled porosity less dense and more deformably resilient than said shaft portion.

3,871,376

COMBINATION ABSORBENT DRESSING AND FLEXIBLE COOLING DEVICE

Theodore F. Kozak, Peekskill, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 13, 1974, Ser. No. 450,580
Int. Cl. A61f 5/44
U.S. Cl. 128—275.1 18 Claims



1. A combination absorbent dressing and flexible cooling device comprising:

a. a dressing composite comprising in combination, a hydrophobic topsheet for placement adjacent to the body and having a plurality of valvular openings therein, a substantially liquid impermeable backing sheet, and an absorbent material disposed between said topsheet and backing sheet and being characterized by its ability to absorb liquid passed through said openings, and a system of dimples disposed on said topsheet;

b. a cooling device associated with said dressing composite comprising a flexible packaging material encompassing and sealing an insoluble hydrophilic gel; and

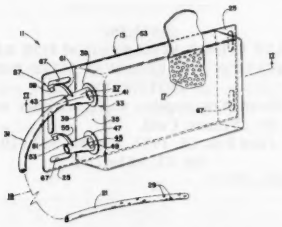
c. an insulating material covering said cooling device and said dressing composite.

3,871,377

EVACUATOR APPARATUS

Harry T. Treace, Germantown, Tenn., assignor to Richards Manufacturing Company, Memphis, Tenn.

Filed Sept. 25, 1968, Ser. No. 762,502
Int. Cl. A61m 1/00
U.S. Cl. 128—278 15 Claims



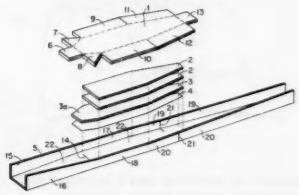
1. Evacuator apparatus useful particularly for evacuating body fluids from a closed wound comprising a body including envelope means defined by wall structure, at least a substantial area of said wall structure being substantially thin and flexible, at least one suction tube having a portion adapted for engagement with the wound of a patient and for conducting body fluids from the wound into the tube interior, connecting means physically sealingly connecting said tube to said wall structure of said envelope means and communicating the suction tube interior with the interior of said envelope means, and resilient means in the interior of said envelope means engaging at least a portion of said thin and flexible area of said wall structure and manually compressible from an uncompressed disposition to a compressed disposition for subsequent movement from said compressed disposition to said uncompressed disposition, said resilient means consisting of yieldable open cellular mass structure means of substantial elastic recovery capacity and also of substantial fluid retaining capacity in the interior thereof in communication through said suction tube with said wound engaging portion of said suction tube for evacuating body fluids from a wound and storing the evacuated body fluids in the interior of said mass structure means when said resilient means moves from said compressed disposition towards said uncompressed disposition.

3,871,378

ABSORBENT BANDAGE

Robert C. Duncan, Wyoming, and Grace L. Smith, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 22, 1973, Ser. No. 343,774
Int. Cl. A61f 13/16
U.S. Cl. 128—290 18 Claims



1. An absorbent bandage, comprising:

a. a hydrophilic absorbent core of compressed absorbent material having a density throughout of from about 0.15 to about 0.30 gm. per cubic centimeter as measured under a load of 50 gm. per square inch, a 0.05 – 0.06 in. thick by 1.50 in. wide specimen of said absorbent core material having a Taber softness between about 1.2 and about 8.7 gram-centimeters;

b. a hydrophobic topsheet having a density substantially less than that of said absorbent core secured in superposed relation to said absorbent core, said absorbent core and said topsheet comprising an absorbent pad for rapidly absorbing and retaining body exudate; and

c. a bottom sheet underlying and secured to said absorbent pad for supporting said absorbent pad in-use.

3,871,379

LAPAROSCOPY INSTRUMENTS AND METHOD FOR SUTURING AND LIGATION

Henry C. N. Clarke, 100 High St., Buffalo, N.Y. 14203

Division of Ser. No. 175,163, Aug. 26, 1971, Pat. No. 3,763,860. This application July 12, 1973, Ser. No. 378,582
Int. Cl. A61b 17/12
U.S. Cl. 128—326 1 Claim

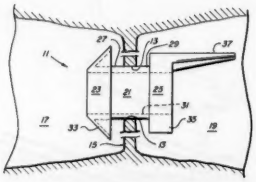
1. A ligator comprising an elongated stem and suture guiding means at one end of said stem, said suture guiding means being of substantially the same cross sectional dimension as said stem and comprising a pair of spaced arms convexly outwardly curved about an axis extending transversely of said stem and converging toward each other at their tip ends remote from said stem and jointly with the end of said stem defining a generally circular opening for guiding a suture, said tip ends of said arms being spaced from each other to provide a suture entrance to said opening, and means for gently and firmly holding said suture comprising a blunt end on said stem opposite from said entrance, said end being convexly rounded

to provide complimentarially grooved recessed portions at the bases of said arms on opposite sides of said stem between said arms.

3,871,380
MYRINGOTOMY DRAIN TUBE

Ricardo J. Heros, Memphis, Tenn., assignor to Richards Manufacturing Company, Memphis, Tenn.

Filed Dec. 3, 1973, Ser. No. 421,144
Int. Cl. A61m *27/00*
U.S. Cl. 128—350 R **9 Claims**



1. A drain tube for inserting into a myringotomy opening in a patient's tympanic membrane to allow drainage of the patient's middle ear through his external auditory canal, said drain tube comprising:

a. a hollow body having an unobstruced passageway of substantially uniform diameter therethrough for extending between the middle ear and the external auditory canal through the myringotomy opening to allow the middle ear to drain therethough; and

b. head means fixedly attached to the forward end of said body for insertion through the myringotomy opening to prevent accidental extraction of said drain tube from the middle ear, said head means including a normally rearwardly directed conical-shaped flange portion being so constructed as to be collapsible to a low profile position for allowing easy insertion thereof through the myringotomy opening without enlarging the myringotomy opening; and having substantial elastic recovery for returning to a high profile position after insertion through the myringotomy opening to prevent accidential extraction therefrom and being reversible to a forwardly directed position when extracted through the myringotomy opening for allowing easy extraction therethrough.

3,871,381
COLD COMPRESS DEVICE

Donald J. Roslonski, 38 Fairview Ave., Bricktown, N.J. 08723

Continuation-in-part of Ser. No. 213,978, Dec. 30, 1971, abandoned. This application May 10, 1973, Ser. No. 358,899
Int. Cl. A61f *7/00*
U.S. Cl. 128—400 **28 Claims**

1. A device for treating mammals comprising:

a flexible, inflatable compress adapted to be placed adjacent a body area to be treated;

said compress comprising a surrounding wall and an inflatable interior cavity formed by said wall;

said compress further comprising an enclosed channel formed in a portion of the compress wall adapted to conduct a fluid refrigerant over said compress wall portion;

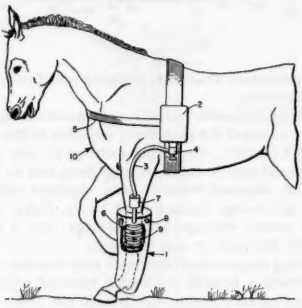
said channel opening into the inflatable interior cavity of said compress and being connected to an external source of compressed refrigerant whereby refrigerant from said source is constrained to pass over said compress wall portion by traversing said channel before entering the inflatable interior cavity of said compress;

means interposed between said source and said channel for controlling the rate of flow of refrigerant from the source into the compress whereby the rate of cooling of said compress can be controlled; and

pressure relief means connected to said compress and communicating between the inflatable interior cavity of the compress and the ambient atmosphere for regulating the maximum pressure in the compress whereby the pressure applied to the body area being treated can be controlled.

24. A flexible, inflatable compress adapted to be placed adjacent a body area of a mammal to be treated;

said compress comprising a surrounding wall and an inflatable interior cavity formed by said wall;



a portion of said wall comprising two layers of flexible thermoplastic material joined to each other by a pattern of heat seals;

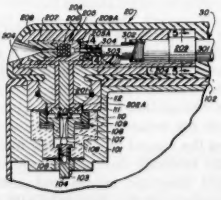
said pattern of heat seals forming an elongated fluid conducting channel extending over said wall portion between said layers; and

one end of said channel opening into the inflatable interior cavity of said compress, and the other end of said channel being adapted to be connected to an external source of compressed refrigerant.

3,871,382
HEART STIMULATOR SYSTEM FOR RAPID IMPLANTATION AND REMOVAL WITH IMPROVED INTEGRITY

Alfred E. Mann, Los Angeles, Calif., assignor to Pacesetter Systems, Inc., Sylmar, Calif.

Filed Feb. 15, 1973, Ser. No. 332,610
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **10 Claims**



1. Heart stimulator system adapted to be implanted within a human body, comprising:

a sealed assembly including a sealed enclosure and pulse generating means housed therewithin, said enclosure defining an open cavity;

a catheter having distal and proximal ends and adapted to be coupled to a human heart adjacent said distal end, with at least one electrode for carrying signals between said

pulse generating means and said heart, said catheter defining an axially extending interior space;

elongated catheter support means defining a transverse passageway coaxial with said catheter interior space and communicating therewith at one end while being open at the other end, said support means being joined to said catheter adjacent said proximal end;

pierceable self-sealing means for sealing said other open passageway end of said catheter support means;

quick connect-disconnect means for sealingly and simultaneously coupling mechanically and electrically said assembly to said catheter and support transversely to said passageway into a sealed unit, including

a male threaded connector secured to said catheter support means adjacent one end thereof, said connector including a conductive portion therewithin insulated from the remainder of said connector, extending to the leading end thereof, and electrically connected to said one electrode, said catheter and said catheter support means forming an integral elongated lever arm for said threaded connector;

a female threaded connector adapted to receive said male connector therethrough and secured within said cavity at the entrance thereof, said male and female connectors defining an axis upon being united which is transverse to that of said catheter passageway and interior space;

a contact member mounted within said cavity and spaced inwardly from said female connector, said contact member being electrically connected to said pulse generating means,

resilient means positioned in said cavity inwardly from said female connector, and responsive to the passage of said male connector through said female connector for sealing said cavity;

said male connector conductive portion thereupon engaging said contact member, effecting electrical as well as mechanical connection with the sealing of said cavity simultaneously, said connection being tensioned with said lever arm to complete a sealed stimulator system which may be equally quickly disassembled and whose catheter may be stylet-positioned without disturbing said connection.

3,871,383

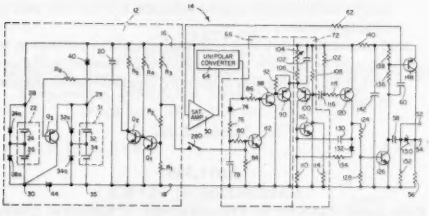
POWER SUPPLY

Jin W. Lee, North Miami, Fla., assignor to Medcor Inc.

Filed Sept. 25, 1973, Ser. No. 400,503

Int. Cl. A61n *1/36*

U.S. Cl. 128—419 PS **7 Claims**



1. In a power supply having a pair of power output terminals, the power supply being connectable to the power input terminals of a body organ stimulating device, the power supply further comprising at least two voltage sources connected in parallel, each voltage source being connected to the power output terminals and having substantially the same initial terminal voltage whereby initially the power output terminals of the power supply are supplied with a voltage substantially equal to the terminal voltage appearing across each voltage source of the power supply, the improvement comprising: voltage regulating means operatively connected to the power output terminals of the power supply and to each voltage source thereof and being responsive to the voltage appearing across the output terminals of the power supply falling to a predetermined value less than the initial terminal voltage of the voltage sources for automatically serially interconnecting each of the voltage sources and the power output terminals of the power supply, and for maintaining the voltage across the power output terminals of the power supply substantially equal to the predetermined value.

3,871,384

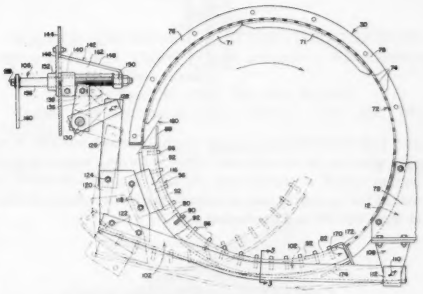
REMOVABLE CONCAVE FOR AN AXIAL FLOW-TYPE COMBINE AND ADJUSTING MEANS THEREFOR

Richard A. Depauw, and Robert W. Hawkins, both of East Moline, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed June 29, 1973, Ser. No. 375,250

Int. Cl. A01f *12/20*

U.S. Cl. 130—27 T **7 Claims**



1. An axial flow combine having a chassis, an elongated longitudinally extending medially disposed cylindrical rotor casing supported on said chassis and embodying an arcuate section in the lower region thereof in the form of a perforate concave which defines an axially extending threshing region, a rotor designed for threshing cooperation with the concave the rotatable about the longitudinal axis of the casing, means for unidirectionally driving said rotor, said concave being movable bodily toward and away from the rotor through small increments of movement to vary the cooperating threshing characterisitics of the rotor and concave, a carrier projecting transversely across said chassis beneath the concave and having its proximate end pivoted to the chassis at one side thereof for swinging movement about a horizontal axis, means fixedly securing said concave to the carrier for movement bodily in unison therewith, and adjustable means effective between the distal end of the carrier and the chassis on the other side of the latter for raising and lowering the carrier.

3,871,385

APPARATUS FOR BUILDING A TOBACCO STREAM

Harry David, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Jan. 9, 1973, Ser. No. 322,198

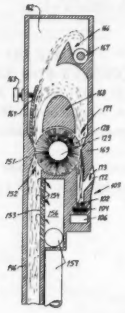
Claims priority, application Germany, Jan. 26, 1972, 2203454; July 5, 1972, 2232856

Int. Cl. A24c *05/39*

U.S. Cl. 131—84 B **15 Claims**

1. In a machine for the making of tobacco filler rods, apparatus for building a tobacco stream comprising a source of comminuted tobacco; a tobacco feeding unit arranged to draw tobacco from said source and including a first conveyor operable at a plurality of speeds to transport the withdrawn tobacco along a first portion of a predetermined path; a tobacco stream transporting second conveyor adjacent to means defining a relatively narrow second portion of said path; an accelerating device comprising a rotary conveyor and wall means

defining with said rotary conveyor a funnel which receives tobacco supplied by said first conveyor, said accelerating device being disposed between said conveyors and operative to mechanically accelerate comminuted tobacco for transfer



into and densification in said narrow second portion of said path wherein the accelerated tobacco forms a narrow growing stream which is transported by said second conveyor; and means for operating said accelerating device independently of at least one of said conveyors.

3,871,386

CIGARETTE MAKING MACHINES

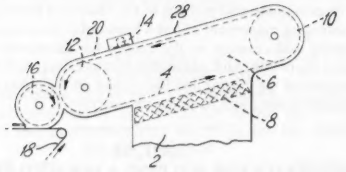
Francis Auguste Maurice Labbe, Neuilly-sur-Seine, France, assignor to Molins Limited, London, England

Filed July 27, 1972, Ser. No. 275,636

Claims priority, application United Kingdom, July 28, 1971, 35512/71

Int. Cl. A24c *5/18*

U.S. Cl. 131—84 B **8 Claims**



1. In a cigarette making machine, a filler stream conveying arrangement comprising a first air pervious conveyor, a second air pervious conveyor having a region which lies close to and is angularly disposed with respect to a region of said first conveyor, means for producing a reduced air pressure with respect to atmosphere on one side of said first conveyor to carry the filler stream thereon by means of suction, means forming an air space adjacent one of said conveyors on the side thereof remote from the other conveyor, the one conveyor being arranged to move past said air space to allow air to pass through said one of said conveyors in the region where it lies close to, but is angularly disposed with respect to, the filler stream being carried by said first conveyor, so as to allow air to enter the filler stream after passing through said one conveyor and in a direction transverse thereto.

3,871,387

ASHTRAY

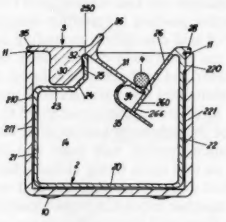
Rido Busse, Napoleonweg 6-8, 7911 Oberelchingen, Germany

Filed Jan. 22, 1973, Ser. No. 325,643

Claims priority, application Germany, Jan. 31, 1972, 2204319; Sept. 27, 1972, 2247223

Int. Cl. A24f *19/14*

U.S. Cl. 131—235 R **7 Claims**



1. An ashtray for receiving and extinguishing cigarette butts and ashes,

comprising in combination:

a housing,

an insert having upper parts defining a gap therebetween, said insert being removably inserted in said housing,

fulcrum means connected to said insert and forming a fulcrum,

one of said upper parts spaced apart from said fulcrum sloping downwardly and having a downwardly directed abutment portion;

a movable cover for said insert having two sections and being tiltably and removably supported on said fulcrum, one section of said cover being tiltable in said gap about said fulcrum between a gap closing position in which it abuts from below against said abutment portion thereby closing said gap, and, respectively, a gap opening position away from said abutment portion, and

the other section of said cover including a counterbalancing weight sufficient for urging said one section into said gap closing position,

said one section defining with said abutment portion in said gap closing position an extinguishing chamber sufficiently air tight to extinguish a burning cigarette when disposed in said chamber.

3,871,388

HAIRDRESSING DEVICE

Rosa Leoci, 3255 De La Pepiniere, Apt. 1, Montreal, Quebec, Canada

Filed Nov. 8, 1973, Ser. No. 444,082

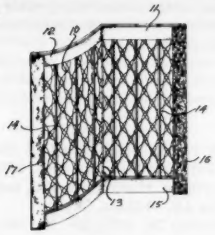
Claims priority, application Great Britain, Feb. 5, 1973, 5579/73

Int. Cl. A45d *1/00*

U.S. Cl. 132—9 **19 Claims**

1. A finishing device for setting strands of hair comprising an essentially flat planar flexible pad, an essentially flat planar flexible cover, means for securing the pad and the cover together into an essentially flat device with the cover overlying the pad such that the strands of hair may be retained therebetween, openings in the pad and the cover adapted to permit air to the strands of hair, and a plurality of malleable members in

one plane of the pad and the cover, said mallable members comprising means for deforming the pad and cover, when



secured together, in the one plane and for retaining that deformation.

3,871,389

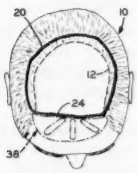
HAIR PIECE AND METHOD OF FORMING AND ATTACHING

Gail Ann Bauer, 16045 Cleveland Rd., Granger, Ind. 46530

Filed Jan. 22, 1973, Ser. No. 325,399

Int. Cl. A41g *3/00*

U.S. Cl. 132—53 **15 Claims**



1. The method of mounting a hair piece on a head which comprises: securing a base ring to live hairs around the hair line surrounding that portion of the head intended to be covered, securing the margin of a flexible textile-like support member to said base ring, attaching first wefts of hair-like material to the base ring, and attaching second wefts of hair-like material to said support member in distributed relation thereon.

3,871,390

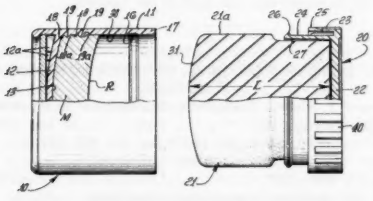
COSMETIC APPLICATOR

Walter B. Spatz, Pacific Palisades, Calif., assignor to Spatz Corporation, Venice, Los Angeles County, Calif.

Filed Sept. 26, 1973, Ser. No. 401,035

Int. Cl. A45d *33/00*

U.S. Cl. 132—83 R **6 Claims**



1. An applicator, comprising a container having a transverse wall and a longitudinal wall extending from said transverse wall to an open end of said container, said container being adapted to contain a cosmetic mass adjacent said transverse wall with the mass terminating substantially inwardly of said open end of said container, a carrier adapted to substantially close said open end, means releasably securing said carrier to said container, a compressible and inherently expandable elastomeric applicator member secured to said carrier and disposed within said longitudinal wall to bear against the cosmetic mass, said applicator member having a forward portion slidable longitudinally along said longitudinal wall during insertion of said applicator member into said longitudinal wall and removal of said applicator member from said longitudinal wall, said applicator member having a normal length when disposed out of said container corresponding substantially to the distance between said carrier and transverse wall when said carrier is secured to said container, whereby insertion of said applicator member in said container compresses said applicator member between said carrier and cosmetic mass, and removal of said applicator member from said container enables said applicator member to expand inherently and return to its normal length.

3,871,391

ROLLER FOR SETTING AND TREATING THE HAIR

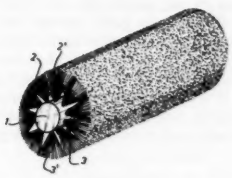
Pierre B. Boudal, Thiers, France, assignor to Ets. Lardenois S.A., Hermes (Oise), France

Filed Mar. 20, 1973, Ser. No. 343,093

Claims priority, application France, Oct. 16, 1972, 72.36511

Int. Cl. A45d *44/18*

U.S. Cl. 132—85 **4 Claims**



1. A hair roller comprising a brush structure consisting of a central elongated support and a plurality of tufts of bristles radially extending from said central support, said tufts being mounted on said central support in a regular distribution and said bristles extending freely from said central support to a length at least corresponding to the diameter of the central support so that the brush structure has an outer periphery only of said bristles for enabling said bristles to freely penetrate hair to separate strands of the hair in a spread-out manner from the surface of the central support to the outer periphery of the brush structure.

3,871,392

DENTAL FLOSS HOLDER

William Burnie Thomas, Carrollton, Tex., assignor to John H. Sparling, Texarkana, Tex., a part interest

Continuation of Ser. No. 206,652, Dec. 10, 1971, abandoned. This application July 19, 1973, Ser. No. 380,561

Int. Cl. A61c *15/00*

U.S. Cl. 132—89 **9 Claims**

1. A dental floss holder comprising:

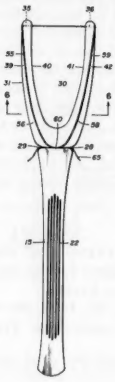
an elongate handle member having a shank portion at one end;

a holder member joined to said handle member at said shank portion thereby forming a unitary structure, said holder member having two laterally spaced apart arms extending therefrom, said arms being provided with slots at their outer ends and adapted to permit dental floss to be strung therebetween;

oppositely opposed groove means positioned in said shank portion subjacent each of said arms to receive and fric-

tionally engage and securely anchor said dental floss as said dental floss is pulled into said groove means and wrapped around said groove means; and

continuous guide channels extending along each of said arms from immediately adjacent the associated slot to a point immediately adjacent the associated groove means where said channels join whereby a predetermined length of dental floss can be strung between said arms by securing one end of said length in one of said oppositely opposed groove means, passing the free end of said length up through the opposite guide channel and through the slot associated therewith, across to the other said slot and downwardly through the other said guide channel and into the other of said oppositely opposed groove means where said free end of said length of dental floss is anchored by tightly pulling said free end and wrapping said free end around said oppositely opposed groove means.



3,871,393

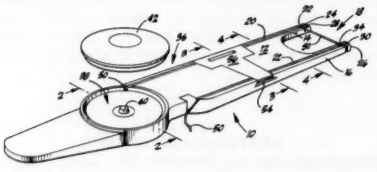
DENTAL FLOSS APPLICATOR

Franklin Eugene Wharton, 1308 Sartori Ave., Torrance, Calif. 90501

Filed Nov. 19, 1973, Ser. No. 416,946

Int. Cl. A61c *15/00*

U.S. Cl. 132—92 A **7 Claims**



1. A dental floss applicator which comprises:

a. A fork member including a base section and spaced first and second prong sections extending therefrom the base and prongs defining a generally U-shaped recess between the prongs, each prong being provided with a longitudinal channel extending longitudinally therealong, a first longitudinal channel on the first prong and a second longitudinal channel on the second prong, the channel along the first prong decreasing in depth towards the free end of the prong and the channel along the second prong increasing in depth towards the free end of the second prong, each channel terminating at the free end of the prong in a notch, each prong also being provided with a transverse channel adjacent the free end thereof at right angles to its longitudinal channel, the transverse channels being in axial alignment, the transverse channel on the first prong being deeper at the point of intersection with the longitudinal channel than the longitudinal channel and the transverse channel on the second prong being shallower at the point of intersection with the longitudinal channel than the longitudinal channel,

b. A handle attached to the base, a reservoir for floss being provided in the handle in communication with the longitudinal channel in the first prong section.

3,871,394

DEVICE FOR TREATING ARTICLES ARRANGED IN CONTAINERS WITH ORGANIC SOLVENTS

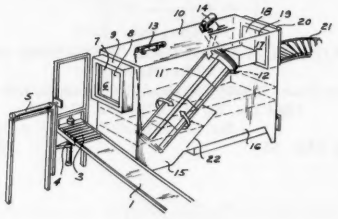
Stig Rune Thegerstrom, Molkom, Sweden, assignor to Thegerstroms Rostfria AB, Molkom, Sweden

Filed May 24, 1973, Ser. No. 363,645

Claims priority, application Sweden, June 6, 1972, 7378/72

Int. Cl. B08b *3/06*

U.S. Cl. 134—46 **9 Claims**



1. A device for treating solid articles with a fluid organic solvent in continuous operation, said device comprising in combination:

a housing having an inlet opening and an outlet opening at opposite ends, the bottom part of said housing constituting a receptacle for treatment fluid;

closure means for selectively closing and opening the inlet and outlet openings;

a container for articles to be treated, said container including wall openings for ingress and egress of treatment fluid; an elongate holder for accommodating the container therein, said holder having openings for passage of treatment fluid and container inlet and outlet openings at its ends, said holder being disposed within the housing;

first mounting means supporting the end of the holder adjacent to the outlet opening of the housing pivotal about an axis transverse of the length of the holder, and second mounting means supporting the holder rotatable about its lengthwise axis; and

drive means for selectively pivoting the holder between a horizontal position and a downwardly slanted position, the holder in its horizontal position being in alignment with the inlet and outlet openings of the housing for feeding containers into the holder and discharging the same therefrom and in its lowered position dipping part of its length into the bath in the housing.

3,871,395

ULTRASONIC/CHEMICAL CLEANER FOR CONTACT LENSES

Edward J. Murry, Palos Park, Ill., assignor to Fibra-Sonics, Inc., Chicago, Ill.

Filed Feb. 26, 1973, Ser. No. 335,822

Int. Cl. B08b *3/10, 11/02*

U.S. Cl. 134—107 **13 Claims**

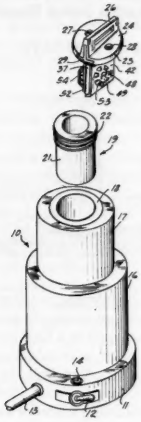
1. An ultrasonic lens cleaner comprising:

a cylindrical shaped lens holding cup in which lens to be cleaned and cleaning fluid are contained,

a heat-resistant cylindrical shaped pot holder including heating means into which said lens holding cup is re-

ceived with intimate wall contact to raise the temperature of said cleaning fluid to the range of 170° to 200° F,

a cylindrical shaped ultrasonic crystal means intimately surrounding said heating means and adapted to produce radially polarized vibrations in said cleaning fluid at an



intensity level in said cleaning fluid on said lens of tensor more watts per square centimeter, and an ultrasonic generator connected to said crystal means to excite it with ultrasonic energy in the frequency range between 20 to 100 kHz.

3,871,396

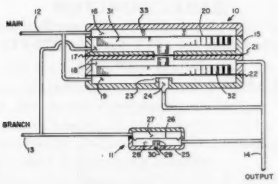
AIR FLOW AMPLIFIER

Louis J. Bentsen, Arlington Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 23, 1972, Ser. No. 265,901

Int. Cl. F15c *3/04*; **G05d** *16/00*

U.S. Cl. 137—85 **4 Claims**



1. An air-flow amplifier having a main pressure inlet, a branch pressure inlet, and a pressure outlet, comprising:

valve means including a valve seat and valve closure means, said valve closure means including

first, second and third diaphragm means,

first and second cooperable pressure plates associated with the first and third diaphragm means respectively;

a housing containing said valve means, said housing having first, second, third, fourth and fifth pressure chambers, said first diaphragm separating said first chamber from said second chamber, said second diaphragm separating said second chamber from said third chamber and said third diaphragm separating said third chamber from said fourth chamber, the valve seat being disposed in the fourth pressure chamber and being arranged to sealably cooperate with the valve closure means to define said fifth chamber pressure;

first connecting means connecting said main pressure to said fourth pressure chamber;

second connecting means connecting said main pressure to said first pressure chamber;

third connecting means connecting said branch chamber to said second pressure chamber;

fourth connecting means connecting said output pressure to said third pressure chamber;

fifth connecting means connecting said output pressure to said fifth pressure chamber; and,

exhaust means connected between the branch pressure inlet and the pressure outlet,

wherein the actions exerted on said valve closure means by said main pressure tend to cancel one another and further wherein said air-flow amplifier tends to maintain said outlet pressure equal to said branch pressure.

3,871,397

VALVE COMBINATION FOR AN OIL BURNER INSTALLATION

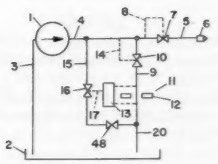
Peder Larsen, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Aug. 6, 1973, Ser. No. 385,892

Claims priority, application Germany, Aug. 22, 1972, 2241177

Int. Cl. G05d *7/01*

U.S. Cl. 137—115 **7 Claims**



1. An oil burner fuel pump assembly comprising a casing having an inlet port and an outlet port, a nozzle, a fluid pressure operated spring biased main valve cooperable with said nozzle, exhaust port means in said casing cooperable with said main valve to regulate the pressure at said nozzle, fluid pressure operated spring biased restrictor valve means downstream from said exhaust port means cooperable with said casing to increasingly restrict the flow of fluid emanating from said exhaust port means in response to the pressure of the fluid in said exhaust port means, and bypass valve means responsive to the pressure difference on opposite side of said restrictor valve means to cause bypassing of pressurized fluid from said inlet port to said outlet port when said pressure difference drops to a predetermined minimum value to present dribbling of said nozzle.

3,871,398

LIQUID-BARRIER GAS VENT

John F. Finger, Beresford, S. Dak., assignor to Sioux Steam Cleaner Corp., Beresford, S. Dak.

Filed Feb. 7, 1974, Ser. No. 440,396

Int. Cl. F16k *9/00*

U.S. Cl. 137—253 **5 Claims**

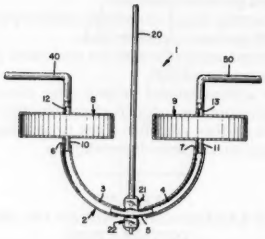
1. A gas vent of the liquid-barrier type, comprising:

a. a sealing chamber having a single inlet and a single outlet, the inlet of which communicates through a first overflow reservoir to a system to be sealed and the outlet of said sealing chamber communicating through a second overflow reservoir to a discharge means;

b. means for filling at least a portion of said sealing chamber with a sealing liquid to thereby provide a liquid seal to

restrain the passage of gas through said chamber, said liquid moveable through said chamber in response to a pressure imbalance between said inlet and outlet caused by venting gas;

c. the volume of each of said overflow reservoirs being sufficient to retain all said sealing liquid that can be displaced from the sealing chamber by venting gas; and

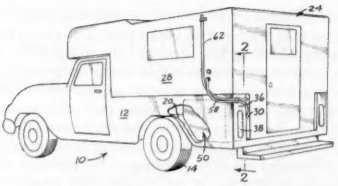


d. each of said reservoirs being elevated relative to the liquid seal portion of said sealing chamber and each permitting gravity return of displaced sealing liquid to said sealing chamber when the pressure imbalance between said inlet and outlet is removed.

3,871,399
HOLDING TANK FOR CAMPERS

Clarence V. Watson, 4715 Rivercrest Dr., North, Salem, Oreg. 97303

Filed Mar. 26, 1973, Ser. No. 345,229
Int. Cl. B62d *33/04;* **B05b** *15/06*
U.S. Cl. 137—344 **8 Claims**



1. In combination with a pickup truck having a rear pickup box with wheel well covers projecting into the box and positioned between the ends of said box, and a camper with plumbing therein mounted in said box with an external lower side wall of the camper extending substantially the length of the box, disposed inwardly of a wheel well cover, and spaced from an adjacent side of said box,

a holding tank positioned between said camper's lower side wall and said adjacent side of said box and disposed toward an end of said box from said wheel well cover,

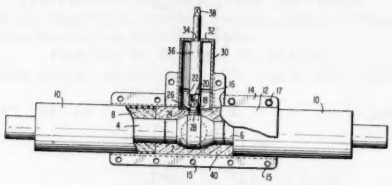
a drain conduit for draining said plumbing and means detachably connecting said drain conduit to the plumbing of the camper, said drain conduit communicating with the interior of said tank adjacent the base of the tank, said drain conduit with release of said means detachably connecting the drain conduit to said plumbing being adjustable to provide for drain flow under gravity from said tank, and

vent conduit means connecting with said tank extending upwardly along the outside of said camper.

3,871,400
STOP VALVES

Ove Thastrup, Fredericia, Denmark, assignor to A/SE Ramussen, Fredericia, Denmark

Continuation-in-part of Ser. No. 223,676, Feb. 4, 1972, , which is a continuation of Ser. No. 21,027, March 19, 1970, abandoned. This application Feb. 22, 1973, Ser. No. 334,713
Claims priority, application United Kingdom, Feb. 22, 1972, 8120/72
Int. Cl. F16l *59/16*
U.S. Cl. 137—363 **16 Claims**

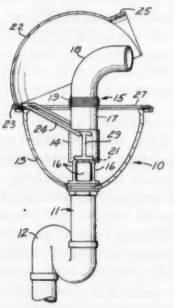


1. A stop valve unit comprising a valve housing with two connection tube studs and an upwardly projecting valve spindle and adapted to be mounted in a heat insulated pipe system in humid surroundings, such as in subterranean district heating pipe system, characterized in that the valve is provided with relatively long connection tube studs which are each surrounded by a heat insulating material except for the outermost end portion thereof, said insulating material again being surrounded by protective tubes these protective tubes having their respective inner ends situated at either side of the spindle, said spindle being surrounded by a spindle tube which adjacent its lower end is closed tightly against the housing of the valve, said inner ends of the protective tubes and lower end of the spindle tube being enclosed within a T-shaped tube casing engaging the respective tube surfaces in a watertight manner, and characterized in that the spindle tube adjacent its lower end is provided with a bowl bottom having a hole for receiving a portion of the spindle projecting from the valve housing, and that sealing means are provided around said portion of the spindle between the underside of the bowl bottom of the spindle tube and the top side of the valve housing.

3,871,401
SEWER CONNECTION

Leo J. Lyons, 2526 Lincoln Dr., San Bernardino, Calif. 92405

Filed June 29, 1973, Ser. No. 375,173
Int. Cl. E03f *5/14*
U.S. Cl. 137—381 **3 Claims**



1. In a sewage disposal unit permanently connected to an underground sewer line in an area where a vehicle containing a sewage discharge hose will be parked, said unit being con-

nectable to said discharge hose to connect the same with said sewer line, the improvement comprising:

a bowl sunk into the ground with its top edge substantially flush with the ground;

an outlet pipe having one end connected to the bottom of said bowl at the lowest point thereof, the other end of said outlet pipe being connected to the underground sewer line;

a tubular sleeve projecting upwardly from the top end of said outlet pipe, said sleeve having large apertures formed in the walls thereof closely adjacent the bottom of said bowl;

a coupling pipe telescopically disposed within said tubular sleeve and slidable therein between upper and lower positions, said coupling pipe projecting above the top end of said sleeve and having an elbow bend forming a laterally projecting, open-ended nozzle to receive the end of the sewage discharge hose on the vehicle, said coupling pipe being normally positioned at said lower position with the bottom end of the coupling pipe covering said apertures in said sleeve when the unit is in operation and is receiving sewage from the vehicle; and

means for elevating and locking said coupling member in said upper position when said discharge hose is to be disconnected from said nozzle, whereby said apertures are opened to allow any sewage spilled into said bowl during the disconnect operation to be hosed down through the apertures into the sewer line.

3,871,402

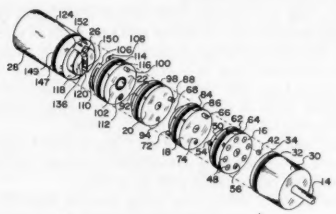
AUTOMATIC TRANSMISSION FLUID CONTROL APPARATUS

William G. Hunt, P.O. Box 545, Laurinburg, N.C. 28352

Continuation-in-part of Ser. No. 344,041, March 22, 1973, abandoned. This application Jan. 8, 1974, Ser. No. 431,742

Int. Cl. F16k *35/00*

U.S. Cl. 137—383 **14 Claims**



1. A device for preventing unauthorized operation of a motive power transmission which uses pressurized fluid flowing in a line, the device comprising:

a gating means having an open position and a closed position, said gating means having a fluid passageway therethrough when in said open position;

a fluid obstructing means associated with said gating means and having a blocking position obstructing the flow of fluid through said passageway and a non-blocking position permitting flow of fluid through said passageway, and means for moving said fluid obstructing means from said non-blocking position to said blocking position responsive to the cessation of fluid flow through said line.

3,871,403

FUEL CONTROL VALVE

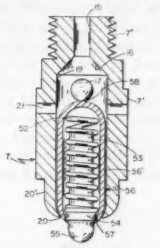
Ansel B. Grose, 8 Mount Vernon St., Stoneham, Mass. 02180

Filed Aug. 30, 1973, Ser. No. 393,038

Int. Cl. F16k *31/26*

U.S. Cl. 137—436 **4 Claims**

1. A fuel control valve comprising a main body portion, an upper passageway in the main body portion, a generally conical passageway in the main body portion having a small end and a large end, and having its small end merging with the upper passageway, an enlarged passage merging with the large end of the conical passageway and extending downwardly through the main body portion, a plunger in said enlarged passage, said body portion having an inwardly turned portion at its lower end positioned to engage the plunger for limiting its outward movement, said plunger comprising an elongated housing open at the lower end and closed at the upper end, a turned-in portion of reduced diameter at the lower open end,



a plunger part within the housing having a flange adjacent one end, providing a shoulder portion on the upper flange portion and abutment portion on the lower flange portion, a stem extending upwardly from the shoulder portion, a spring surrounding the stem and engaging the upper shoulder portion of the flange at one end and the closed upper end of the housing at the other end, the turned-in portion of the housing being arranged to engage the lower abutment portion of the plunger flange to limit the outward movement thereof.

3,871,404

FLUID-TIGHT AND SEPARABLE COUPLING, LIQUID-FILLING DEVICES FOR RESERVOIRS

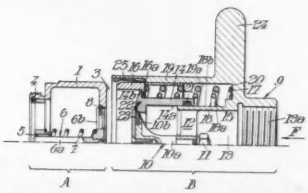
Jacques Courant, Epinay-Sur-Seine, France, assignor to Societe Zenith-Aviation, Levallois Perret, France

Filed Jan. 15, 1974, Ser. No. 433,476

Claims priority, application France, Feb. 2, 1973, 73.03799

Int. Cl. F16k *1/00*

U.S. Cl. 137—614.03 **8 Claims**



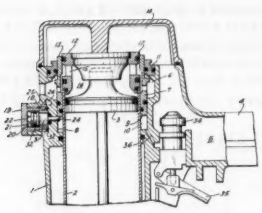
1. Fluid-tight and separable coupling, liquid filling device for reservoirs, constituted by two elements suitable for adaptation respectively to an orifice of the reservoir and to the end of an inlet pipe for the liquid, the first element comprising a rigid nozzle provided with a fixed annular seat and with a transverse support surface and a central movable valve member guided axially on this nozzle and capable of being pushed, against the effect of first elastic means, away from said seat and towards the inside of the reservoir, and the second element comprising a rigid tubular body carrying a fixed valve member rigidly fixed, arranged to push the movable valve member of the first element on coupling of the two elements and on which is coaxially guided a movable annular seat, cooperating with the fixed valve member of the second element and urged by second elastic means which tend to thrust against this fixed valve member by outward movement, the movable annular seat being guided on the body with the interposition of sealing means and possessing other sealing means adapted to cooperate with the transverse surface of the rigid

nozzle, and arranged to cooperate by abutment with said transverse surface, said device comprising an annular pusher provided in the second element, third elastic means guiding said annular pusher coaxially to the seat and urging it outwardly, said annular pusher being also adapted to cooperate by abutment with said transverse surface, so that, when an operator brings the second element axially towards the first by exerting sufficient thrust to overcome the force of the third elastic means, it causes successively, by direct contact of said transverse surface of the rigid nozzle with the annular pusher, the withdrawal of the latter then, by an additional movement, the withdrawal of the movable annular seat (opening of the inlet pipe) accompanied by the driving-in of the movable valve member (opening of the reservoir) by contact with the fixed valve member, the interruption of said thrust causing automatically movements in the reverse direction under the effect of the assembly of above-mentioned elastic means, that is to say the closing of the two seats by their respective valve members and the enforced separation of the two elements.

3,871,405
SPRING-LESS CONTROL VALVE FOR A PERCUSSION MACHINE DRIVEN BY PRESSURE FLUID

Heinz Schwarz, Zizishausen, Germany, assignor to Karl M. Reich Maschinenfabrik, Nuertingen, Germany

Filed Aug. 22, 1973, Ser. No. 390,617
Int. Cl. F15b *31/01*
U.S. Cl. 137—624.27 **6 Claims**

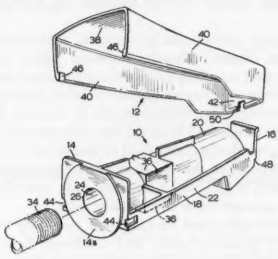


1. In a pneumatic nailing machine which is actuated by pressurized air from a source of compressed air, an improved spring-less control valve for controlling the flow of the pressurized air, said control valve having a valve body formed as a differential piston and having opposite reactor surface areas which is reciprocably slidably mounted in said machine to move between an open and closed position, and arranged to be urged closed by pressure applied to both reactor surface areas, means communicating at least one of the reactor surface areas directly with said source of compressed air, a blocking piston reciprocably slidable in said machine adjacent to said valve body so as to move between a first blocking position and a second retracted position relative to said valve body, said blocking piston moving into said first blocking position when not acted on by said pressurized air and into said second retracted position when acted on by said pressurized air, means for venting the larger reactor surface to effect opening of the control valve when not blocked by the blocking piston, the improvement comprising conduit means which directly communicate said source of compressed air with said blocking piston.

3,871,406
WATER SPOUT

Leslie T. Anderson, London, Ontario, Canada, assignor to EMCO Limited, London, Ontario, Canada

Filed Oct. 29, 1973, Ser. No. 410,438
Claims priority, application Canada, Dec. 11, 1972, 159040
Int. Cl. E03c *1/04*
U.S. Cl. 137—801 **12 Claims**



1. A spout comprising a base and a removable cover both moulded from a plastics material,

said base being elongated and having integrally formed therewith a back wall, a front wall, side walls, a top and a bottom, and said cover for said base having a top, side walls and a front wall,

said base having a water way therethrough; the input opening of said water way of said base terminating on said back wall, the output end of said water way terminating in said bottom of said base adjacent to said front wall and being a discharge opening,

said front wall and said side walls of said cover being spaced to embrace said front wall and said side walls of said base and, when in embracing relationship therewith, to dispose said top of said cover in overlying relation resting on the top of said back wall and said front wall of said base, and said front walls of said cover and base being formed for interlocking relationship with each other,

the lower marginal portions of said side walls of said base and said cover including detent and lug means formed for interlocking relationship with each other,

said side walls of said cover being flexible laterally with respect to each other whereby to enter into and out of said interlocking relationship with said base.

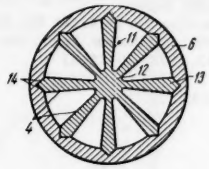
3,871,407
HEAT EXCHANGE APPARATUS

Alexandr Vasilievich Bykov, ulitsa Dimitrova 19, kv. 106; Igor Martynovich Kalnin, ulitsa Kropotkinskaya 26, kv. 13; Vladimir Nikolaevich Krotkov, ulitsa Chkalova 24/32, kv. 132; Fedor Nikolaevich Dyachkov, ulitsa Chkalova 7, kv. 16, all of Moscow; Viktor Ivanovich Plokhov, ulitsa Stroitelei 20, kv. 75, Kuibyshev; Mikhail Fedotovich Golovinov, ulitsa Pugachevskaya 59, kv. 16, Kuibyshev; Veniamin Kuzmich Erokhov, ulitsa Svobody 230, kv. 62, Kuibyshev, and Jury Stepanovich Starostin, ulitsa Krasnykh Kommunarov, 6, kv. 36, Kuibyshev, all of U.S.S.R.

Filed June 20, 1973, Ser. No. 371,843
Int. Cl. F15d *1/00*
U.S. Cl. 138—38 **2 Claims**

1. A heat-exchange apparatus comprising: at least one heat-exchange tube; a centrally disposed, longitudinally extending core accommodated in said tube; at least three radially extending ribs on each core, the outer ends of said ribs being shaped as wedges having pointed ends directed radially away from the center of said core, and said ribs being press-fitted

with said ends into the inner wall of said tube to a depth equal to the height of said wedges, thereby raising the contact pressure between said outer rib ends and said inner tube wall, with concomitant increased contact heat-exchange characteristics.

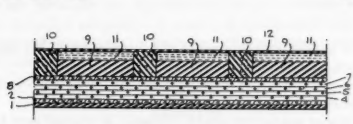


3,871,408

OIL SUCTION AND DISCHARGE HOSE

James Wood, 65 Silverknowes Gardens, and George Sunnett, 15 Viewforth Square, both of Edinburgh, Scotland

Filed Aug. 10, 1973, Ser. No. 387,555
Claims priority, application United Kingdom, Aug. 4, 1972, 36519/72
Int. Cl. F16l *11/12*
U.S. Cl. 138—137 40 Claims



1. A flexible suction and discharge hose comprising:
a tubular substrate including a plurality of plies of reinforcing cords, the cords in each ply extending parallel to one another at a pre-selected bias angle relative to the axis of the tubular substrate and being crossed with respect to the cords of each next adjacent ply;
a plurality of axially alternating sections of a first material and of a second material circumferentially surrounding said substrate, the second material being more flexible then the first material,
a fibre reinforcement layer overlying the sections of the first material only, said fibres having a tensile modulus greater than 50 grams per denier; and
an outer cover circumferentially surrounding said fibre reinforcement layer and said sections of said second material.

21. A flexible suction and discharge hose comprising:
a tubular substrate;
a plurality of axially alternating sections of a first material and of a second material circumferentially surrounding said substrate, the second material being more flexible than the first material, and
a fibre reinforcment layer overlying the sections of the first material only, said fibres having a tensile modulus greater than fifty grams per denier.

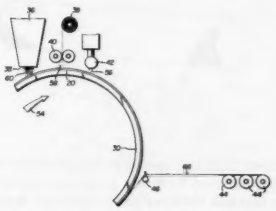
3,871,409

REINFORCED SYNTHETIC PIPE WALL CONSTRUCTION

Agnar Gilbu, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 21, 1973, Ser. No. 361,936
Int. Cl. F16l *9/12*
U.S. Cl. 138—174 13 Claims

1. In a wall for underground installation and the like and seving to confine a liquid, a wall structure comprising:
a. a thermosetting resin matrix cured and comprising from about 30 to 40 percent by weight of said wall,
b. chopped glass fibers randomly oriented and substantially uniformly distributed through said resin matrix, comprising from about 10 to 20 percent by weight of said wall;
c. a pulverulent filler uniformly distributed in said resin matrix comprising about 15 to 60 percent of said wall, and



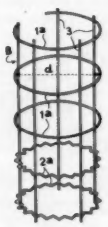
d. filament wound, substantially continuous glass fibers within said resin matrix concentrated at the opposed exterior and interior portions of said wall, comprising about 5 to 30 percent by weight of said wall.

3,871,410

LATTICE FOR THE REINFORCEMENT OF TUBULAR CONCRETE ELEMENTS

Maurice Francois, Saint Dizier, France, assignor to Trefilunion, Paris, France

Continuation of Ser. No. 109,424, Jan. 25, 1971, abandoned, which is a division of Ser. No. 808,252, March 18, 1969, Pat. No. 3,578,036. This application Oct. 17, 1972, Ser. No. 298,321
Int. Cl. F16l *9/08*
U.S. Cl. 138—175 1 Claim



1. A hollow tubular or like shape one-piece reinforcing lattice of welded metal wire-like members for use as a reinforcement in a concrete pipe, said lattice comprising warp members and weft members, and having a body portion of one diameter and a socket portion of a larger diameter, the warp members which define the body portion being work-hardened and of high strength, other warp members at one end of said lattice which define said socket portion being formed of a material which is ductile, said ductile members being elongatable and stretchable to provide said larger diameter socket portion.

3,871,411

SEAMLESS SCREEN PIPES

Takayuki Sato; Hideo Ota; Jiro Yokoyama, all of Osaka, and Takashi Nakamura, Nara, all of Japan, assignors to Satosen Company Limited, Osaka-shi, Japan

Filed Sept. 7, 1972, Ser. No. 287,017
Int. Cl. F16l *9/00*
U.S. Cl. 138—178 3 Claims

1. A seamless screen pipe particularly suitable for screen printing of textiles comprising a seamless tubular screen con-

sisting of essentially organic fibers arranged in a reticular configuration having between about 100–300 mesh per inch, said fibers being spaced apart a distance (H) on one side of said reticular configuration, and a metal film formed on the surface of the constituent fibers of said tubular screen with the

meshes thereof retained, said constituent fibers of said tubular screen being selected from the group consisting of polyester, polyamide and silk filament yarn, with said metal film having a thickness of between about ½to 1/10 the distance (H) by which said fibers are spaced apart on one side of said reticular configuration.

3,871,412

REVERSIBLE VERDOL JACQUARDS

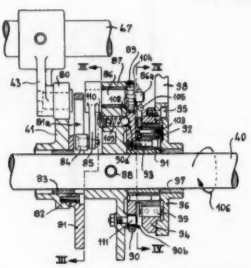
Gabriel Servillat, Rhone, France, assignor to Verdol S.A., Caluire, France

Filed Sept. 7, 1973, Ser. No. 395,147

Claims priority, application France, Oct. 16, 1972, 72.37167

Int. Cl. D03c *3/32*

U.S. Cl. 139—1 E **10 Claims**



10. In a Verdol jacquard comprising at least one cam adapted to actuate the pusher grid horizontally, the said cam being rotatably carried by a reversible driving shaft on which it is angularly displaceable with respect to said shaft between a first fixed position which it occupies during forward operation of the jacquard and a second fixed position which it occupies during backward operation thereof, the improvement comprising: a support member fixed to the shaft adjacent to said cam; connecting means interposed between said cam and said support member and including lever means displaceable selectively into either of two opposed orientations, one orientation maintaining the cam in said first fixed position and the other orientation maintaining the cam in said second fixed position; and means carried by the shaft responsive to reversals in its direction of rotation and coupled to said connecting means and operative when the shaft reverses from forward to backward rotation to displace said lever means and move said cam into the second position, and operative when the shaft reverses from backward to forward rotation to displace said lever means and move the cam into the first position.

3,871,413

SHUTTLE ARRANGEMENT FOR A CIRCULAR LOOM FOR A TAPE YARN

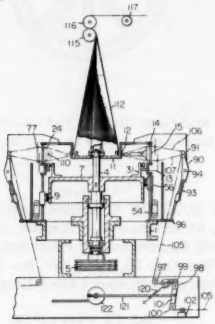
Soichi Torii, Kyoto, Japan, assignor to Torii Winding Machine Co., Ltd., Kyoto, Japan

Filed Mar. 29, 1974, Ser. No. 456,059

Claims priority, application Japan, Dec. 19, 1973, 48-146695; Oct. 12, 1973, 48-115043

Int. Cl. D03d *37/00*

U.S. Cl. 139—13 **7 Claims**



1. A shuttle arrangement for a circular loom for tape yarn, comprising:

an inner guide ring, which guides the lower warp yarn sheet, and also guides the woven tubular fabric;

an upper guide ring which defines a V shaped area together with said inner guide ring, within which area a weft yarn is inserted into the shed defined by the upper and lower warp yarn sheets, and also which guides the upper warp yarn sheet;

a shuttle race, provided with a top shuttle race and a bottom shuttle race, and a plurality of shuttle guide rods, and between said rods a warp yarn can freely pass, and the diameter of said shuttle race is larger than the inner or upper guide rings, and this shuttle race and said inner and upper guide rings are arranged concentrically, so that the shuttle can be horizontally held between this shuttle race and said pair of the guide rings;

a shuttle provided with a weft yarn package arranged horizontally and the inner portion of said shuttle can be inserted into the space defined by said inner guide ring and upper guide ring, while the outer portion of the shuttle is guided by said shuttle race and, furthermore, said shuttle is provided with a roller by which a pushing force is applied to the shuttle so that the shuttle can travel along its circular path;

a shuttle driving apparatus, which is mounted on a rotating cam disc provided with a curved projection so as to induce the shedding motion of the heald frame, and which is provided with a pushing roller for pushing said roller on the shuttle, and a driving roller for positively driving said pushing roller.

3,871,414

DEVICE FOR PRODUCING A FALSE SELVEDGE ON A FABRIC AS WELL AS WEAVING LOOMS PROVIDED WITH SUCH A DEVICE

Jacques Palencher, Troyes (Aube), France, assignor to Lebocey Industrie, Troyes (Aube), France

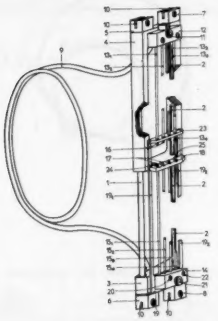
Filed July 12, 1973, Ser. No. 379,014

Int. Cl. D03c *11/00*

U.S. Cl. 139—54 **11 Claims**

1. A device for producing a false selvedge on a fabric, comprising two rods together slidingly receiving a first block

and a second block, each block supporting thread guides, said rods being provided at their ends with abutments for said blocks, spring means located between said blocks tending constantly to separate one block from the other, means for displacing the thread guides laterally during oscillation of the



blocks with respect to one another, said device being characterized by the thread guides of the second block being mounted pivotally on said second block, a linking member being mounted pivotally on said first block, and said linking member having orifice means for slidingly receiving during oscillation the thread guides of said second block.

3,871,415

JACQUARD MECHANISM

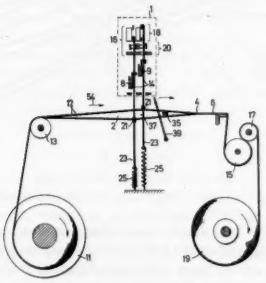
Brenner Wolfgang; Feier Gunter, and Vinnemann Antonius, all of Stuttgart, Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 17, 1973, Ser. No. 361,036

Claims priority, application Switzerland, May 19, 1972, 7465/72

Int. Cl. D03c *3/20*

U.S. Cl. 139—59 **21 Claims**



1. In a jacquard machine having lifting hooks, a pair of draw knives and means for selectively displacing said lifting hooks into coupling engagement with a respective knife, said means including a bendable spring connected to a respective one of said lifting hooks, said spring being bendable between a first position with said one lifting hook coupled to a respective draw knife and a second position with said one lifting hook uncoupled from said respective draw knife and coupled to the other of said draw knives.

3,871,416

ARRANGEMENT FOR WEAVING WITH A HALF-CLOSED SHED IN A LOOM

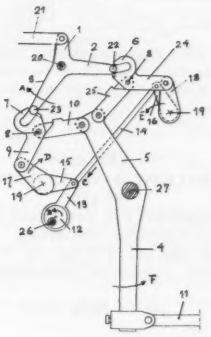
Sven Nyman, Malilla, Sweden, assignor to Almhults Bruk AB, Almhult, Sweden

Filed Aug. 31, 1973, Ser. No. 393,407

Claims priority, application Sweden, Oct. 3, 1972, 12726/72

Int. Cl. D03c *1/06*

U.S. Cl. 139—72 **3 Claims**



1. An arrangement for weaving with a half-closed shed in a loom in which a harness change is controlled by a harness machine programme of a programming device, whereby the warp threads, which are made to cross over during a harness change, are if there is to be no harness change, brought by the harness close to each other without reaching the plane of cloth in the loom, said arrangement comprising at least one pair of two-armed levers mounted on a common shaft, one arm of each of said levers being adapted to control the movement of the harness through an independent push rod and each two-armed lever having associated therewith

a. a pair of toggle linkages with one link of each linkage being pivotably connected to the other arm of each of said two-armed levers;

b. a pair of arms attached to separate rotatable shafts adapted to rotate with each shuttle movement of the loom in mutually opposite directions between two end positions, each arm of said pair of arms being privotably connected to the other link of each of said toggle linkages;

c. and transmission means adapted, under the action of the harness machine programme, alternatively to straighten one of said pair of toggle linkages while folding the other one of said toggle linkages so that if there is a harness change, a change will take place between said pair of linkages, but there will be no such change between the linkages if there is no harness change.

3,871,417

FORK LINK FOR USE IN THE HEDDLE FRAME LINKAGE OF A WEAVING MACHINE

Walther Filter, Langenhagen, Germany, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria and Etablissement Wanderfield & Co., Schaan, Liechtenstein

Filed July 17, 1973, Ser. No. 380,062

Claims priority, application Austria, July 27, 1972, 6456/72

Int. Cl. D03c *13/00*

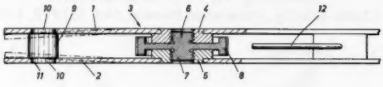
U.S. Cl. 139—88 **5 Claims**

1. A heddle frame linkage comprising

1. a pivotal connecting means, and

2. a forked link having two prongs each of which has a bearing eye receiving the pivotal connecting means,

a. the bearing eyes being coaxially aligned and
b. the prongs being adapted to be spread apart and moved towards each other in the direction of the axis of the bearing eyes, and

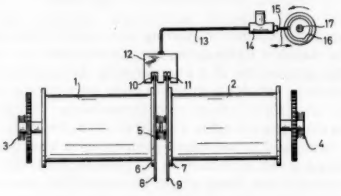


c. a screw drive disposed between, and operatively connected to, the prongs, the screw drive being operable to spread the prongs apart and move them towards each other.

3,871,418
WEAVING MACHINE HAVING COMPONENT WARP BEAMS

Otto Hintsch, Wallisellen/CH, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Aug. 28, 1973, Ser. No. 392,184
Claims priority, application Switzerland, Oct. 3, 1972, 014421/72
Int. Cl. D03d *49/06*
U.S. Cl. 139—100 **6 Claims**



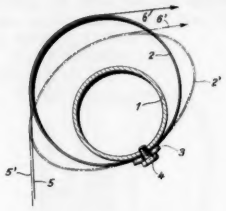
1. In a weaving machine having at least two coaxially mounted component warp beams, said beams being disposed in adjacent relation to sub-divide the machine width and a main drive shaft;
a blocking means for selectively blocking rotation of each warp beam during a predetermined portion of a cycle of said machine; and
control means for activating said blocking means in synchronism with the rotation of said drive shaft whereby during beat-up said warp beams are locked in place.

3,871,419
DEFLECTING BEAM FOR WARP THREADS IN A WEAVING MACHINE

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Dec. 11, 1972, Ser. No. 314,102
Claims priority, application Switzerland, Dec. 10, 1971, 18030/71
Int. Cl. D03d *49/12, 39/22*
U.S. Cl. 139—114 **12 Claims**

1. A deflecting beam for warp threads in a terry cloth loom comprising an elongated rigid non-rotatable support for disposition across the path of the warp threads and an elastically yieldable guide member secured to said support, said guide member having two longitudinal edges secured to said support and an elongated curved surface extending between said edges and across the path of the warp threads for sliding of the threads thereon, said surface being curved similarly to a cylindrical surface to at least partly surround said support, said guide member being made of leaf-spring like material for resiliently deforming under the influence of a variable tension in the threads in a direction away from said path coinciding with the angle bisector between the planes of an incoming

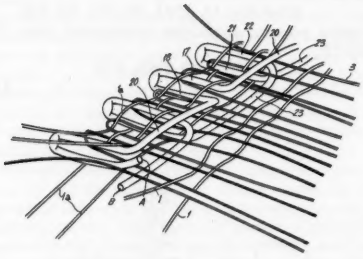


group of the warp threads and an outgoing of the warp threads.

3,871,420
METHOD AND APPARATUS FOR MANUFACTURING SLIDE FASTENER ELEMENTS

Horst Jakob, Choisy-le-Roi, France, assignor to Prestil, Choisy-le-Roi, France

Continuation-in-part of Ser. No. 295,019, Oct. 4, 1972, abandoned. This application Jan. 2, 1974, Ser. No. 429,819
Claims priority, application France, Oct. 13, 1971, 71.36698
Int. Cl. D03d *35/00*
U.S. Cl. 139—116 **6 Claims**

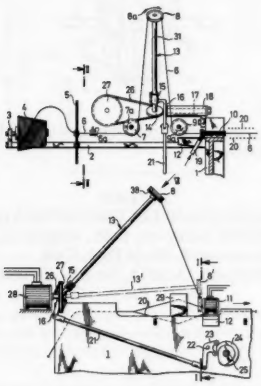


1. Method of manufacturing a slide fastener by incorporating a continuous filament between the warp and weft yarns of a tape, in order to form with said filament transverse loops constituting coupling members along one edge of said tape, this method being characterised in that during the tape weaving operation there are inserted into said tape two separate filaments adapted to form the coupling members by engaging by turns said filaments between said warp yarns at spaced intervals, in order to form at each point of insertion a transverse loop formed by winding said filaments in opposite directions, by turns, while disposing said filaments in the longitudinal direction on the side opposite to the coupling members proper, whereby said filament form two variable-pitch helices of which the loops wound in opposite directions are imbricated, every other loop belonging to the same helix.

3,871,421
WEAVING MACHINE HAVING A VARIABLE WEFT YARN PATH

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Sept. 27, 1973, Ser. No. 401,275
Claims priority, application Switzerland, Oct. 9, 1972, 14746/72
Int. Cl. D03d *47/34*
U.S. Cl. 139—122 R **10 Claims**



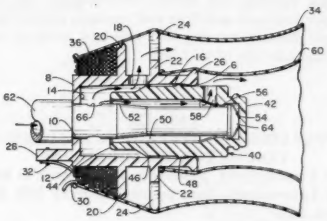
1. In a weaving machine having first means for forming a shed, second means for mounting a weft yarn supply bobbin outside said shed, and a plurality of guide elements between said shed and said second means for guiding a weft yarn to be picked into said shed, said guide elements including a pair of stationary elements, at least one of said guide elements being movable to vary the yarn path and form a loop of weft yarn between said stationary elements; a guide roller mounted on said movable guide element for passage of the weft yarn thereover and being rotatably mounted about a longitudinal axis and a drive means for rotating said roller about said axis in the direction of movement of the weft yarn to be picked.

3,871,422
DUAL BALLOON VALVE

Edward E. Elson, Anaheim, and Aaron Goldsmith, Northridge, both of Calif., assignors to Automatic Helium Balloon Systems, Inc., Beverly Hills, Calif.

Filed Feb. 14, 1973, Ser. No. 332,369
Int. Cl. F16k *15/20*
U.S. Cl. 137—231 **15 Claims**

1. A valve for at least two inflatable articles such as balloons comprising the combination: an open-ended tubular valve body member having spaced first and second peripheral flanges and a third terminal flange; an aperture in the wall of said body member intermediate said first and second flanges, at least one of said first and second flanges being adapted for gas tight association and engagement with a first inflatable article, said third terminal flange being adapted for gas tight association and engagement with a second inflatable article within said first inflatable article, said second flange having at least one discontinuous wall section; a tubular valve slide member longitudinally movable within said body member and said second inflatable article between an advanced open position and a retracted closed position and being in substantially gas tight sliding engagement with a longitudinally extending peripheral sealing area due to the coaction with the inside of said body member, said slide member being closed at its front

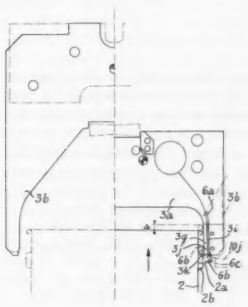


end and open at its rear end and having at least one port formed therein between the ends thereof which communicates with a point forwardly of said sealing area when said slide member is in its open position; means for restricting relative movement between said body and slide member; and means for obtaining relative movement therebetween.

3,871,423
MACHINE FOR ASSEMBLING A PIVOTABLE HANDLE WITH A PACKAGE

Yves J. Lhermet, Cabries, France, assignor to Societe Anonyme Sabatier S.A., Vitrolles, France

Filed Jan. 22, 1974, Ser. No. 435,218
Claims priority, application France, Jan. 26, 1974, 74.04017
Int. Cl. B21f *45/00*
U.S. Cl. 140—93 B **7 Claims**



1. In a machine for assembling a U-shaped handle having free ends with a package having a pair of outwardly opening cavities respectively at opposite sides of said package, said handle being bent inwardly at its free ends to provide a pair of opposite, facing, free end portions which extend inwardly and at a substantial angle with respect to the remainder of the handle, said machine having supporting means for said package which permits movement thereof in a direction transverse to a line extending through both said cavities and having means for positioning said handle with respect to a package on said supporting means so that said free end portions are respectively on opposite sides of said package and adjacent and aligned with said cavities, the combination therewith of a pair of spaced stop means respectively disposed to be received between said so-positioned handle and opposite sides of said package for engaging a first portion of said handle adjacent but spaced from one of said free end portions and a second portion adjacent but spaced from the other of said free end

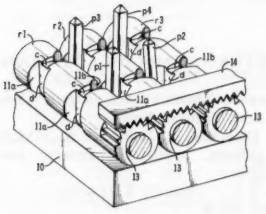
portions and for restraining said first and second portions against movement toward said package, and a pair of spaced bending means respectively disposed to receive said free end portions therebetween and movable inwardly toward said package, said bending means being engageable with said handle at portions thereof adjacent to said free end portions thereof for bending said handle intermediate said first and second portions and said free end portions around said stop means and thereby moving said free end portions into said cavities and laterally of said line.

3,871,424

APPARATUS FOR REALIGNING ELECTRICAL CONNECTOR TERMINAL PINS

Matthew Francis Slana, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 6, 1974, Ser. No. 448,677
Int. Cl. B21f *1/02*
U.S. Cl. 140—147 **11 Claims**



1. Apparatus for aligning an electrical connector terminal pin comprising cam means adapted for positioning adjacent said pin, said cam means comprising a lobe face for urging said pin a first direction as said cam means is rotated when said pin is bent from a proper alignment in a direction opposite to said first direction, said cam means also comprising tapered flanges on said lobe face adapted for slidably engaging said pin for also urging said pin in a second direction at substantially right angles to said first direction as said cam means is rotated when said pin is bent from a proper alignment in a direction opposite to said second direction.

3,871,425

BOTTLING METHOD AND APPARATUS

David C. Fee, Elm Groove, and William F. Hammernik, Milwaukee, both of Wis., assignors to Federal Mfg. Co., Milwaukee, Wis.

Filed Oct. 10, 1973, Ser. No. 405,095
Int. Cl. B65b *3/04*
U.S. Cl. 141—5 **18 Claims**

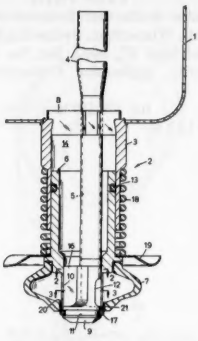
1. The method of filling a resiliently deformable bottle with liquid which comprises:

a. placing the empty bottle into communication with separate supply, vent and suction passages;

b. feeding liquid into the bottle through said supply passage while maintaining said vent and suction passages separately in communication with said bottle;

c. closing said supply and vent passages after liquid has passed through the filled bottle into said vent passage;

d. temporarily applying suction to said suction passage while said supply and vent passages are closed, until part of the bottle content has been withdrawn through said suction passage; and



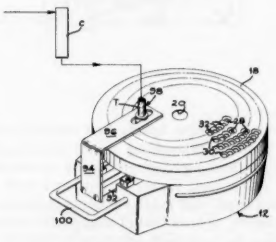
e. removing the bottle from the closed supply, vent and suction passages.

3,871,426

FRACTION COLLECTING APPARATUS

Robert M. McNeill, Sunnyvale, Calif., assignor to Eldex Laboratories, Incorporated, Menlo Park, Calif.

Filed Oct. 15, 1973, Ser. No. 406,316
Int. Cl. B65b *43/50*
U.S. Cl. 141—130 **4 Claims**



1. In a fraction collector the combination comprising a body having a lower planar surface and a plurality of equi-size liquid receiving chambers having upward openings, said chambers being disposed in uniform spaced relation along a spiral path about a central point on said body, a base having means for mounting said body for rotation about said central point, a carriage and means on said base for constraining said carriage for movement on a radial path below said lower surface, a drive wheel mounted in said carriage for rotation about a radially disposed axis, said drive wheel having a periphery in contact with said lower body surface for establishing a frictional driving connection therebetween, means mounted in said carriage for rotatively driving said drive wheel at a substantially constant speed so as to impart to the portion of said body in contact with said drive wheel a correspondingly constant tangential speed, an arm having a first end fixed to said carriage and a second end overlying said upper surface in substantial vertical alignment with said drive wheel, means for moving said carriage along said radial path in a first radial direction in response to said drive wheel rotatively driving said body so that the second end of said arm traverses the spiral path of the chambers, and means for resiliently biasing said carriage along said radial path in a second direction opposite said first direction so that on disengagement of said lower body surface from said drive wheel periphery, said biasing means moves said carriage in said second direction.

3,871,427
DEVICE FOR FELLING TIMBER

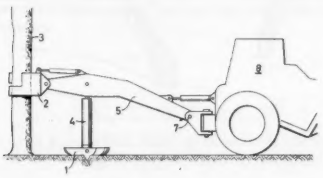
Lars Harald Widegren, Arent Frapegatan 31, Kiruna, and Tage Oskar Keskitalo, Knavagen 9, Tuolluvaara, both of Sweden

Continuation-in-part of Ser. No. 73,251, Sept. 16, 1970, Pat. No. 3,802,663, which is a division of Ser. No. 807,775, March 17, 1969, Pat. No. 3,643,900. This application Oct. 29, 1973, Ser. No. 410,571

Claims priority, application Sweden, June 28, 1968, 8943/68

Int. Cl. A01g *23/08*

U.S. Cl. 144—34 E 5 Claims



1. An apparatus for felling timber by pulling up trees with their roots, comprising:

a. at least one ground support member,

b. at least one lever arm pivotally mounted to the ground support member at one end,

c. a lifting device bearing upon the lever arm,

d. at least one hydraulically operated gripping device coupled to the lever arm for gripping the tree trunk from the side,

e. drive means coupled to the lifting and gripping devices,

f. a driving source feeding said drive means,

g. a plurality of cutting blades disposed in a plane perpendicular to the longitudinal axis of the tree, and movable to cut the tree from opposite sides thereof, and

h. hydraulic means to move the blades to sever the roots from the tree.

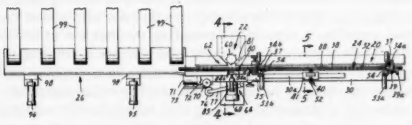
3,871,428
METHOD FOR REDUCING THE OCCURRENCE OF BOWING IN WOODEN WINDOW RAILS

Kenneth L. Peterson, Bayport, Minn., assignor to Andersen Corporation, Bayport, Minn.

Division of Ser. No. 301,130, Oct. 26, 1972, Pat. No. 3,825,046. This application Mar. 12, 1974, Ser. No. 450,366

Int. Cl. B27c *1/02*

U.S. Cl. 144—323 2 Claims



1. A method for reducing the occurrence of bowing in wooden window sash rail members which are milled along one surface to form a groove for receiving a pane of glass, said method comprising the step of cutting a concave curvature along a surface of the rail member opposite the surface milled so as to receive the glass pane, said curvature being sufficiently concave to overcome the natural tendency of the rail member to bow subsequent to the milling operation.

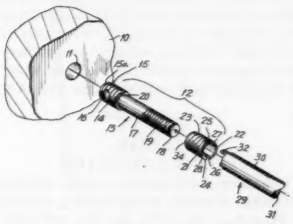
3,871,429
LOCKING SELF-TAPPING THREADED STUD INSERT ASSEMBLY AND METHOD

Robert W. Bosse, Englewood Cliffs, N.J., assignor to Groov-Pin Corporation, Ridgefield, N.J.

Filed Feb. 28, 1973, Ser. No. 336,872

Int. Cl. F16b *39/00*

U.S. Cl. 151—14 R 3 Claims



1. For use in conjunction with a cylindrical bore formed in a body, a self-tapping threaded stud insert assembly for installation in the cylindrical bore, the material of the body being relatively softer than the material of said insert assembly, said assembly comprising an elongated shank including an enlarged cylindrical inner end portion of a length less than the depth of the bore and a reduced diameter cylindrical outer end portion forming a continuation of said inner end portion, said inner and outer end portions being disposed in coaxial alignment, an outwardly facing annular shoulder formed at the junction of said inner and outer end portions, a self-tapping cutting thread portion beginning at said inner end and extending helically about the circumference of said inner end portion for the self-tapping of threads within the bore to a greater depth than the length of the inner end, a retaining thread portion beginning at said outer end and extending helically about the circumference of said outer end portion, and an elongated tubular locking sleeve having an internal bore slidable over said outer end portion, a locking shoulder at the lead end of said sleeve adapted to engage said annular shoulder, drive means formed in the trailing end of said sleeve, the outer circumference of said sleeve being formed with a helical thread matching the thread of said inner end portion of said shank for substantially full engagement with the threads tapped in the bore by the inner end.

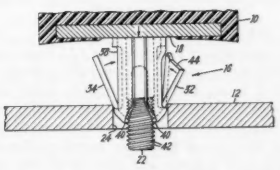
3,871,430
RETAINER CLIP

Engelbert A. Meyer, Union Lake, Mich., assignor to USM Corporation, Boston, Mass.

Filed Oct. 26, 1973, Ser. No. 410,037

Int. Cl. F16b *21/00*

U.S. Cl. 151—41.75 2 Claims



1. A one-piece push-on type clip for securing a non-rotatable threaded stud in axial relation to a workpiece having an elongated hole for receiving the stud endwise, the clip comprising a hollow non-circular body of sheet metal partly open at one end and wholly open at the other end and having oppositely disposed resilient side portions laterally extending

between said ends, said side portions being spaced apart by slightly less than the lesser dimension of said hole, each of said side portions being coined with a generally straight edge to cooperatively grip a locality of the threads of the stud, and each of the side portions when unstressed having an outwardly inclined resilient wing portion divergent substantially from the thread engaging locality, free ends of the wing portions being spaced apart more than the lesser dimension of said hole, one of the wing portions being arranged to be cammed inwardly by a side wall of the hole and the other of said portions being formed with a combination axial and radial take-up and locking shoulder arranged to be urged into partly overlapping abutment with the workpiece adjacent to another side of the hole by radial pressure exerted by said one wing portion in reaction to its engagement with said side wall of the hole.

3,871,431

PROTECTIVE CHAINS

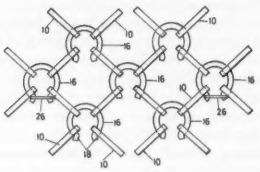
Hans Otto Dohmeier, Johannesburg, South Africa, assignor to Dome Inventions Limited, Johannesburg, South Africa

Filed Nov. 10, 1972, Ser. No. 305,281

Claims priority, application South Africa, Nov. 25, 1971, 71/7933

Int. Cl. B60c *11/00*

U.S. Cl. 152—243 **1 Claim**



1. A tire chain consisting of a reticulation of elongate, end-perforated links, and connector links onto which the links are threaded, characterized in that:

each connector link is an omega-shaped open loop, gapped to allow links to be threaded onto it, and shaped for a link to be threadable onto and be separable from it only by movement of the connector link and the link relative to each other along an arc and in which there are four links on each of a plurality of loops.

3,871,432

ALL GLASS REINFORCED TIRE CONSTRUCTION

Frank J. Lachut, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 235,228, March 16, 1972, abandoned. This application May 7, 1973, Ser. No. 357,731

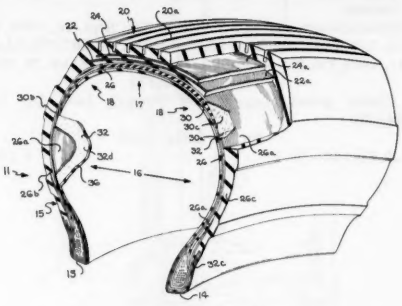
Int. Cl. B60c *9/12*

U.S. Cl. 152—354 **21 Claims**

9. In a tire construction composed of (1) a pair of spaced beads, (2) a connecting carcass of generally radially disposed cords, embedded in an elastomeric matrix layer, extending toroidally from bead to bead and at least partially encircling said beads, (3) a ground contacting tread carried at the crown of said carcass and (4) at least two tread reinforcing belts located between said carcass and said tread and extending circumferentially about said tire, said belts each including a plurality of mutually parallel vitreous cords, said tire including shoulder regions on either side of the tread; the improvement which includes:

a first layer of elastomeric stock on the inner side of said carcass, said layer including a plurality of short lengths of glass, and

a second layer of elastomeric stock on the inner side of said first layer and said carcass, said second layer extending



toroidally from bead to bead, said second layer containing a plurality of short lengths of glass.

3,871,433

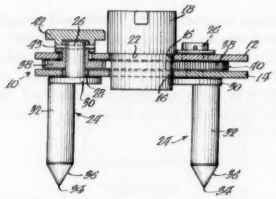
ADAPTOR FOR TIRE CHANGING STANDS

David M. Carpenter, Nashville, Tenn., assignor to The Coats Company, Inc., La Vergne, Tenn.

Filed Sept. 11, 1973, Ser. No. 396,186

Int. Cl. B60c *25/06*

U.S. Cl. 157—1.24 **5 Claims**



1. An adaptor for use with a tire changing stand, comprising: a base having a central opening for receipt of a spindle of a tire changing stand; a plurality of at least three fingers extending generally perpendicularly from said base, each having a free end remote and projecting away from said base adapted to engage a tire rim mounted on a tire changing stand; means, including an eccentric connection, pivotally mounting each of said fingers, at spaced locations, on said base and about said central opening; a motion transmitting mechanism interconnecting each of said fingers whereby when one is rotated, the others will be rotated and each will move in a circular path such that the spacing between each and the radial distance to the center of said central opening may be selectively adjusted so that said finger free ends may be properly located to engage rims of different sizes.

3,871,434

SECURITY SCREEN FOR WINDOW

Allen P. Hance, 1857 E. Gray, Mesa, Ariz. 85203

Filed Jan. 24, 1974, Ser. No. 436,064

Int. Cl. E06b *9/01*

U.S. Cl. 160—91 **3 Claims**

1. A window-screen frame combination for mounting in an opening of a wall or door comprising:

a screen frame for insertion into the opening from one side thereof,

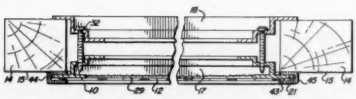
said screen frame defining a flange extending laterally of the opening parallel with and over its peripheral edges,

said screen frame further defining a surface extending laterally of said flange of said screen inwardly of and around the peripheral edges of the opening and then inwardly of the opening and parallel with said flange of said screen,

a window frame for insertion into the opening from the other side thereof,

said window frame defining a flange extending laterally of the opening parallel with and over its peripheral edges,

said window frame further defining a surface extending laterally of said flange of said window inwardly of and around the peripheral edge of the opening and then inwardly of the opening and parallel with said flange of said window,



a security screen for fastening to said screen frame,

said security screen comprising a metallic frame defining an opening,

a metallic screen mounted on said frame and covering its opening,

the outer edges of at least three sides of said security frame being bent over on itself to form channels between the frame and its bent over edges,

said channels receiving a pair of outer parallel edges of the flange of the screen frame upon said metallic frame being slid over the outer edges of said frame from one end thereof,

and means extending through said window frame and into threaded engagement with apertures in said screen frame for tightly securing said security frame to the peripheral edge of the opening between said flanges on said screen frame and the periphery of the wall or door opening.

3,871,435

MODULAR ROOM DIVIDER

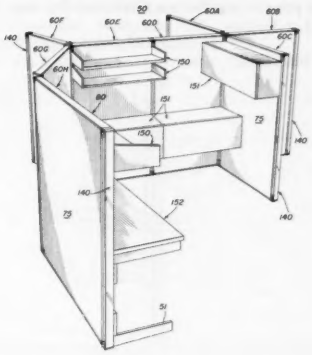
Dale R. Lopatka, Hawthorn Woods, Ill., assignor to Reflector Hardware Corporation, Melrose Park, Ill.

Continuation of Ser. No. 130,227, April 1, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,273

Int. Cl. A47g *5/00*

U.S. Cl. 160—135 **13 Claims**

1. A modular room divider comprising a plurality of interconnected divider modules, each of said divider modules includint an upstanding panel and two sets of hinge members, one of said two sets of hinge members being respectively fixedly mounted on said panel adjacent to each opposite side edge thereof, each of said sets of hinge members including two vertically spaced pairs of hinge elements, one of said vertically spaced pairs being female elements and the other of said pairs being male elements, the female elements at one side edge being horizontally aligned with the male elements at the other side edge and being located near the top of said panel, the others of said pairs of hinge elements being horizontally aligned and being located near the bottom of said panel, each of the vertically spaced pairs comprising a horizontally spaced pair of hinge elements respectively fixedly disposed adjacent to the two spaced-apart front and back surfaces of said panel, whereby one of said sets of hinge members is constructed and arranged complementary to the other of said sets of hinge members for coupling engagement to provide a pivotal coupling between adjacent modules, whereby each divider module may be simultaneously pivotally coupled at said two vertically spaced elevations to as many as two other divider modules at each side edge to form said room divider and to accommodate arrangement thereof in numerous different configurations.



3,871,436

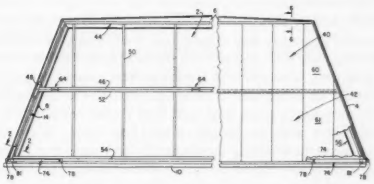
TRAPEZOIDAL DOOR FOR CLOSING THE TRAPEZOIDAL OPENING OF A BUILDING STRUCTURE

Verne L. Gile, Harvard, Ill., assignor to Erect-A-Tabe. Inc., Harvard, Ill.

Filed Oct. 3, 1973, Ser. No. 403,216

Int. Cl. E04f *15/00*

U.S. Cl. 160—188 **9 Claims**

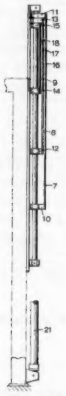


1. A door for use in connection with a building structure having a trapezoidal-shaped door opening, said door comprising a plurality of sections hingedly or pivotally connected to each other, said sections when the door is in fully closed position having a trapezoidal shape to conform to the trapezoidal opening of the building structure to close said opening, means for moving said sections relative to each other and for lifting said door to open position to uncover said opening of said building structure, means connecting at least one of said door sections to said building structure adjacent said door opening so that the upward and downward movement of said door as it folds and unfolds in moving to open and closed positions is held adjacent and in close proximity to the building structure, said last mentioned connecting means comprising a horizontally positioned member adjacent the bottom of the lower section of the door supporting an axially movable member thereon which is connected to the building structure and moves upwardly and inwardly at an inclined angle as the door moves to open position and downwardly and outwardly at an inclined angle as the door moves to a closed position.

3,871,437
MACHINE GUARDS

William Leslie Jones, Tipton, England, assignor to A.H.M. Machines Limited, Birmingham, England

Filed Aug. 6, 1973, Ser. No. 385,811
Claims priority, application Great Britain, Aug. 12, 1972, 37697/72
Int. Cl. E05d *15/16*
U.S. Cl. 160—202 6 Claims



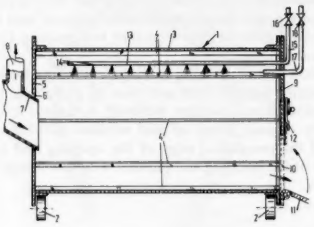
1. In combination with a machine, a guard comprising a fixed portal structure defining an access opening and a plurality of frames movably mounted on said structure, said plurality of frames including a first frame in a first position slidably mounted on guide means on said structure for relative movement to a second position, a second frame in a first position slidably mounted on said guide means for relative movement to a second position, a guard panel carried on said second frame, a guard panel carried on said first frame underlying said first mentioned guard panel so that said access opening is unobstructed by said guard panels, driving means mounted on said portal structure and connected to at least said first frame for moving said first and second frames to said second respective positions wherein said guard panels extend adjacent to each other to close said access opening, the arrangement of said frames being such that said first frame rests within said second frame with the length of said first frame in the direction of movement being substantially less than the length of said second frame in the direction of movement, said first and said second frames each having first end abutments abutting in said first position, and said first and second frames each having second end abutments opposed to said first end abutments with said second end abutments abutting when said guard is in said second position, said driving means being connected to said first frame, movement of said first frame from said second position to said first position being transmitted through said first end abutments.

3,871,438
PROCESS FOR REGENERATING RESIN-BONDED FOUNDRY SAND

Bastiaan Vissers, Heemstede, Nr. Glipperdreef, and Willem Teunissen, Amstelveen, Nr. Buyschenstein, both of Netherlands

Filed Feb. 16, 1973, Ser. No. 333,409
Claims priority, application Netherlands, Feb. 16, 1972, 7201998
Int. Cl. B22d *29/00*
U.S. Cl. 164—5 11 Claims

1. A process of regenerating foundry sand bonded with a thermo-setting synthetic resin and forming part of a mould and cores that have been used for manufacturing castings, comprising the steps of depositing said whole sand mould together with its hot castings and any sand cores into a rotating vessel and tumbling such materials in that vessel during a time period sufficient to ensure that the sand mould and cores

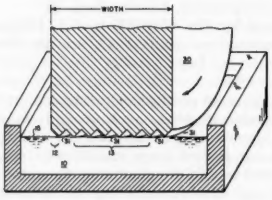


through contact with said hot castings are heated to such a temperature that the synthetic resin is removed from the sand by spontaneous inflammation and combustion and the sand mould and cores are completely broken down to discrete sand particles.

3,871,439
METHOD OF MAKING FILAMENT OF SMALL CROSS SECTION

Robert E. Maringer, Worthington, and Carroll E. Mobley, Columbus, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 292,280, Sept. 26, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 456,649
Int. Cl. B22d *11/06*
U.S. Cl. 164—87 11 Claims



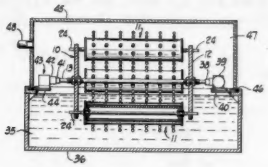
1. A method of making a plurality of filaments having an effective diameter less than 1,500 microns comprising: contacting the free surface of a pool of molten material with the circumferential extremities of a plurality of tapering machine screw threads on the outer radial surface of a cylindrical heat-extracting member rotating at a rate yielding a linear speed at said circumferential extremities in excess of 3 ft/sec, the contacting being to a depth no greater than the root depth of said threads and providing a plurality of narrow elongated contacts with the molten material.

3,871,440

APPARATUS FOR FORMING CERAMIC SHELL MOLDS

Robert A. Horton, Chesterland, Ohio, assignor to Precision Metalsmiths, Inc., Cleveland, Ohio

Division of Ser. No. 172,035, Aug. 16, 1971, abandoned. This application June 22, 1973, Ser. No. 372,586
Int. Cl. B22c *13/08*
U.S. Cl. 164—165 3 Claims



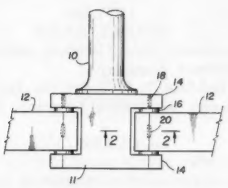
1. An assembly for use in producing refractory molds comprising:
   a. support means,
   b. shaft means fixed to and extending from said support means so that said assembly can be mounted for rotation,
   c. a plurality of pattern set-ups supported by said support means, said pattern set-ups being arranged about said shaft means and radially spaced therefrom,
   d. each of said set-ups including sprue means,
   e. rod means fixed to said sprue means and extending beyond the ends of said pattern set-ups, said sprue means being secured to said rod means for movement therewith, and
   f. means for releasably securing said rod means to said support means so that said pattern set-ups are fixed against rotation about their longitudinal axes and so that said pattern set-ups can be removed and replaced.

3,871,441

DUMMY BAR FOR CONTINUOUS CASTING

Joseph Pietryka, Paris, France, assignor to Fives Lille-Cail, Paris, France

Filed Mar. 26, 1973, Ser. No. 344,648
Claims priority, application France, Mar. 29, 1972, 72.10950
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 3 Claims



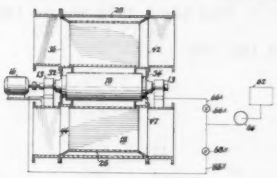
1. A dummy bar for use in a continuous casting operation and comprised of a series of parts linked together, a joint interconnecting each two adjacent ones of the dummy bar parts for enabling the parts to pivot about an axis, and the pivoting axes of all joints being substantially parallel to each other, each of the joints including an end of one of the adjacent parts and a pivoting axle fast with the end of the other adjacent part and extending in a respective one of the axes, the pivoting axle passing through a bore in the one adjacent part and mounting the one adjacent part pivotally on the other adjacent part, a peg affixed to the pivoting axle and received in a keyway in the bore extending in an axial direction, the width of the keyway exceeding that of the peg with sufficient play to permit only a selected angular movement between the parts transversely of the pivoting axis, and means for closing the ends of the keyway from the outside.

3,871,442

LIFTING ARRANGEMENT

Harlan E. Finnemore, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Mar. 8, 1973, Ser. No. 339,244
Int. Cl. F28d *19/00*
U.S. Cl. 165—8 5 Claims



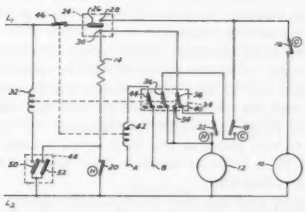
1. In rotary regenerative heat exchange apparatus having a horizontal rotor post, a mass of heat absorbent material carried concentrically around the rotor post to comprise an annular rotor, housing means surrounding the rotor having end plates with openings for a heating fluid and a fluid to be heated, bearing means supporting the rotor post for rotation about its axis, means for rotating the rotor about its axis to align the heat absorbent material alternately with the heating fluid and the fluid to be heated, means for raising the rotor post from the bearing means comprising a yoke subjacent the rotor post, an elastomeric bladder expansible against said yoke, a source of hydraulic fluid, and means for inflating said elastomeric bladder with the hydraulic fluid to force the yoke against the rotor post to support the rotor post on said yoke independent from the bearing.

3,871,443

SAFETY CONTROL FOR A REMOTE CONTROL SYSTEM

Allen G. Jones, Baltimore, Md., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 17, 1974, Ser. No. 461,535
Int. Cl. F24f *13/00*
U.S. Cl. 165—11 8 Claims



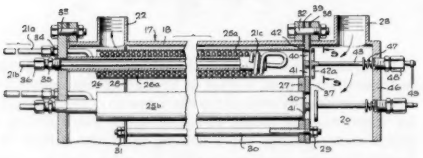
1. Safety control apparatus for a remotely controlled zone unit having heating and cooling system including a fan for circulating enclosure air comprising:
   mode control means including switch means for placing said zone system in condition to operate either in a normal heating or cooling operating mode or in a safety heating mode;
   remote control input means responsive to a remote control source for turning said zone unit on and off; and
   safety thermostat switch means responsive to a predetermined temperature for simultaneously conditioning said mode control means to operate said system in the safety heat mode and to override the operation of the remote

control input means and said normal operating mode to automatically energize said heating system.

3,871,444
WATER QUALITY ANALYSIS SYSTEM WITH MULTICIRCUIT SINGLE SHELL HEAT EXCHANGER

Edwin A. Houser, Fullerton, and Bernell W. Schwindt, Walnut, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 2, 1971, Ser. No. 168,096
Int. Cl. F28f *27/02*
U.S. Cl. 165—101 **8 Claims**



1. A single closed shell multicircuit heat exchanger wherein each of said separate heat exchange circuits affords an individually adjustable rate of flow of coolant for a sample to be cooled therein, said heat exchanger comprising;

a. an elongated heat exchanger shell, said shell having a first closure plate at a first end thereof and a second closure plate positioned inwardly from the second end thereof;

b. a first plenum chamber detachably mounted on said first end of said heat exchanger shell, said first plenum chamber having cooling water inlet means connected thereto;

c. an end plate detachably connected to said shell at said second end thereof to form with said second closure plate a second plenum chamber in said second end of said shell, said second plenum chamber having cooling water outlet means connected thereto;

d. a plurality of apertures in each of said closure plates;

e. a plurality of hollow cylindrical baffle spools extending between said closure plates inside said heat exchanger shell and detachably secured to said first and second closure plates, each spool surrounding one aperture in each of said plates so that each spool defines the outer limits of a separate coolant flow path between said plenum chambers;

f. means on said end plate to detachably mount a plurality of coils of sample tubing, each coil extending into one of said spools, each of said coils having a sample inlet tube and a sample outlet tube continuous therewith and both extending out of its associated spool, through said second plenum chamber and said end plate and out of said heat exchanger;

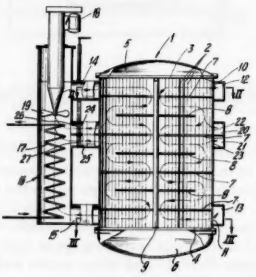
g. each of said coils being separately and individually removable from said heat exchanger by removing said first plenum chamber and said heat exchanger shell from said end plate, sliding said spool off of the coil to be removed, and disconnecting said coil from said end plate; and

h. separate means operatively associated with each of said spools to regulate the rate of flow of cooling water through that individual spool independently of the rate of flow of cooling water through any other spool.

3,871,445
REACTION APPARATUS FOR CARRYING OUT EXOTHERMIC AND ENDOTHERMIC CHEMICAL PROCESSES WITH RADIAL FLOW OF A HEAT EXCHANGE MEDIUM

Oskar Wanka, Deggendorf, Donau; Friedrich Gutlhuber, Metten, and Hermann Graf, Hengersberg, all of Germany, assignors to Deggendorfer Werft und Eisenbau GmbH, Deggendorf, Donau, Germany

Filed Jan. 12, 1973, Ser. No. 323,224
Claims priority, application Germany, Jan. 13, 1972, 2201528
Int. Cl. F28d *15/00;* **B01j** *9/00*
U.S. Cl. 165—107 **11 Claims**



1. In a reaction apparatus for carrying out exothermic and endothermic chemical reactions, of the type having an annular nest of contact tubes in a reaction tank and over which a heat exchange medium, circulated by forced flow producing means through an external heat exchanger and supplied and discharged through respective axially spaced annular supply and discharge conduits connected to the heat exchanger, is directed to flow, the improvement comprising, in combination, baffle means arranged in said tank to extend transversely of the length of said tubes to direct the heat exchange medium to flow alternately in opposed radial directions over said tubes between said supply and discharge conduits; and at least one additional annular conduit, at at least one point of said tank intermediate said supply and discharge conduits, connected to said heat exchanger and said tank and supplying and discharging a regulable partial amount of the heat exchange medium.

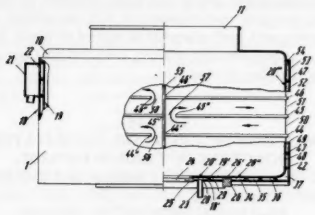
3,871,446
MIXER COOLER

Hartmut Langenberg, Buer, Germany, assignor to Dierks & Sohne, Osnabruck, Germany

Filed Sept. 7, 1972, Ser. No. 286,949
Claims priority, application Germany, Sept. 17, 1971, 2146611
Int. Cl. F28f *13/12*
U.S. Cl. 165—109 **10 Claims**

1. A mixer-cooler, comprising a mixing vessel into which a substance to be mixed may be introduced, a mixing tool arranged therein and designed to rotate about a vertical axis, the mixing vessel having internal and external walls defining between them a cavity through which a coolant flows, the mixing tool being configured to propel the substance radially outwardly along the base of the vessel and thereafter up the internal wall of the vessel, a coolant inlet in the base of the vessel and a coolant discharge near the upper rim of the vessel, guide elements in said space to guide the coolant on its passage between the coolant inlet and the coolant discharge in a direction generally corresponding to the direction of propulsion of the substance, the guide elements subdividing the cavity of the double wall into a coolant duct extending in labyrinthine fashion from the coolant inlet to the coolant discharge in at least the radially outer zone of the base-side

cavity of the double wall, the flow duct consisting of concentric duct sections formed by guide baffles extending substantially concentrically to the vessel axis each of which duct sections extends over a centrally subtended angle of around 360° and communicates through a radial transfer orifice with the particular adjacent, radially outer duct section in a series



disposition, the flow duct in the side wall zone of the double wall being made up of duct sections defined by guide baffles arranged coaxially, at intervals, parallel one above the other in the cavity, each of said duct sections extending over a centrally subtended angle of 360° and communicating through an axial transfer orifice with the particular adjacent, axially upper duct section in a series disposition.

3,871,447

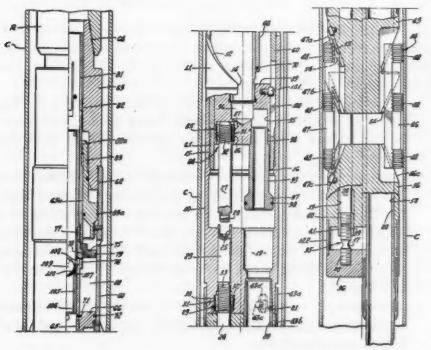
TUBING HANGER SETTING TOOL

Talmadge L. Crowe, Houston, Tex., assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Division of Ser. No. 275,911, July 28, 1972, Pat. No. 3,830,295, which is a division of Ser. No. 243,806, April 13, 1972, Pat. No. 3,771,603. This application June 8, 1974, Ser. No. 475,384

Int. Cl. E21b *23/00*

U.S. Cl. 166—120 **12 Claims**



1. In a setting tool for a tubing hanger anchorable in a well casing and having a receptacle for the setting tool, said setting tool comprising: an elongated outer tubular body having means at its upper end for connection with a running pipe string, an elongated inner body longitudinally shiftably disposed in said outer body, piston means carried by said bodies and forming a pressure chamber therebetween, said inner body having a fluid passage extending longitudinally therein and a port leading between said passage and said pressure chamber, valve means normally closing said port to admit pressure fluid to said pressure chamber from said passage, connector means on said outer body for connection with one part of the tubing hanger, connector means on said inner body for connection with another relatively movable part of the tubing hanger, whereby pressure fluid applied to said pressure chamber to effect relative longitudinal shifting of said bodies will effect corresponding shifting of the tubing hanger parts, and a plurality of flow tubes carried by said inner body and projecting downwardly therefrom, said flow tubes having passages communicating with said passage in said inner body.

3,871,448

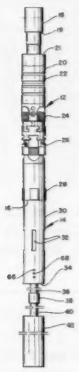
PACKER ACTUATED VENT ASSEMBLY

Roy R. Vann, Artesia, and Flint R. George, Hobbs, both of N. Mex., assignors to Vann Tool Company, Inc., Artesia, N. Mex.

Filed July 26, 1973, Ser. No. 382,958

Int. Cl. E21b *33/12*

U.S. Cl. 166—128 **11 Claims**



6. A packer actuated vent assembly comprising a packer device having a body, a packer element, a hollow mandrel, and means by which the packer device can be anchored downhole in a well bore, said mandrel being movable relative to the packer body for setting the packer element which precludes fluid flow across the packer device;

a barrel attached to and extending from the body, a mandrel extension attached to and extending from said hollow mandrel in series flow relationship therewith, aperture means in said mandrel extension forming a flow path from the interior to the exterior thereof; a valve means connected to said mandrel extension for causing a fluid flow path to be formed from without to within said mandrel extension when said valve means is moved from a flow preventing to a flow permitting position;

and means responsive to relative movement between said barrel and said mandrel extension for moving said valve means from said flow preventing to said flow permitting position.

3,871,449

CASING HANGER AND PACKOFF APPARATUS

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

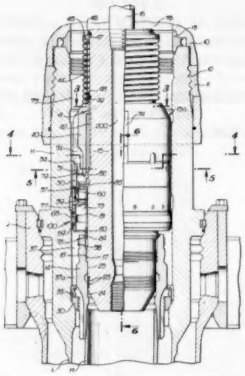
Filed Mar. 4, 1974, Ser. No. 447,506

Int. Cl. E21b *33/128*

U.S. Cl. 166—183 **15 Claims**

1. Hanger apparatus for supporting a tubular string extending into a well bore from a surrounding wellhead: comprising a hanger body adapted to be located in the wellhead and having a sealing surface; a running tool connectible to a running string; means releasably connecting said hanger body to said running tool to enable said hanger body to be lowered into the wellhead; packing means; means for supporting said packing means from said hanger body and above said sealing

surface while said hanger body is connected to said running tool; means for releasing said supporting means upon release of said releasable connecting means to discontinue support of said packing means from said hanger body and allow said



packing means to move downwardly of said hanger body towards said sealing surface; and means for actuating said packing means to effect its sealing engagement with said sealing surface.

3,871,450

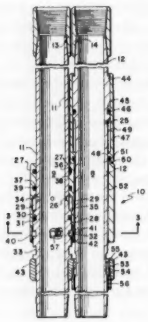
DUAL STRING CIRCULATING VALVE

Marion B. Jett, Seagoville, and Dennis M. Spriggs, Dallas, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 17, 1974, Ser. No. 461,684

Int. Cl. E21b *41/00, 43/14*

U.S. Cl. 166—224 R **20 Claims**



1. A well valve assembly for use in dual production strings, said assembly comprising:

a tubular elongated primary mandrel having connection means at each end thereof for interconnection with other tubular sections;

a tubular elongated secondary mandrel in generally parallel orientation with said primary mandrel; both of said mandrells having port means through the walls thereof;

a body member encircling both said mandrels in relatively snug slidable relationship, said body member having port means through one side thereof;

first pressure responsive means between said primary mandrel and said body member and communicating with said port means in said primary mandrel; said pressure responsive means arranged to move said body member axially on said primary mandrel upon application of fluid pressure through said primary mandrel port means to said first pressure responsive means, whereby said body member ports are placed in communication with said primary mandrel ports; and

second pressure responsive means on said secondary mandrel in communication with said secondary mandrel ports and arranged to move said body member in response to fluid pressure applications to said secondary mandrel, whereby said body member is moved to block fluid communication from said primary mandrel port means to said body member port means.

3,871,451

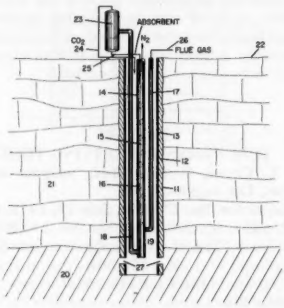
PRODUCTION OF CRUDE OIL FACILITATED BY INJECTION OF CARBON DIOXIDE

Larry P. Brown, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed May 3, 1974, Ser. No. 466,668

Int. Cl. E21b *43/00*

U.S. Cl. 166—267 **15 Claims**



1. In a process for recovering crude oil from a hydrocarbon bearing formation wherein carbon dioxide is introduced into said formation for dissolving in the crude oil therein, the improvement which comprises:

a. injecting an absorbent for carbon dioxide into a tubing string of a well, said absorbent being an organic compound in the form of a liquid when injected into the tubing string,

b. introducing a flue gas which contains carbon dioxide and nitrogen into the tubing string containing the absorbent, the flue gas being introduced into said tubing string at a depth where the carbon dioxide dissolves in the absorbent whereas the nitrogen passes through it, thus separating and removing the nitrogen from the presence of the carbon dioxide,

c. subsequently reducing the pressure on the absorbent and separating carbon dioxide which vaporizes and thus leaves the absorbent,

d. injecting the separated carbon dioxide into a hydrocarbon bearing formation.

3,871,452

MOBILITY CONTROLLED CAUSTIC FLOODING PROCESS FOR RESERVOIRS CONTAINING DISSOLVED DIVALENT METAL CATIONS

Amir M. Sarem, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 284,345, Aug. 28, 1972, Pat. No. 3,805,893. This application Mar. 26, 1974, Ser. No. 454,866

Int. Cl. E21b *43/22*

U.S. Cl. 166—270 **18 Claims**

1. A process for recovering petroleum from subterranean reservoirs having connate water containing dissolved divalent

metal cations and penetrated by one or more injection wells and at least one production well spaced apart in the reservoir, which comprises injecting through at least one of said injection wells and into said reservoir small slugs of (1) aqueous alkali metal hydroxide solution, (2) a dilute aqueous solution of an alkaline alkali metal silicate having a molar ratio of M_2O/SiO_2 of 1 or above wherein M is an alkali metal atom, (3) water, (4) a dilute aqueous solution of a water-soluble material that reacts with the alkaline alkali metal silicate to form a precipitate, and (5) water; repeating steps 1 through 5 a plurality of times; and recovering petroleum from said production well.

3,871,453

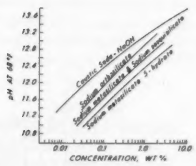
MOBILITY CONTROLLED CAUSTIC FLOODING PROCESS FOR HIGHLY HETEROGENEOUS RESERVOIRS

Amir M. Sarem, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 284,345, Aug. 28, 1972, Pat. No. 3,805,893. This application Mar. 1, 1974, Ser. No. 447,299

Int. Cl. E21b *43/22*

U.S. Cl. 166—270 **15 Claims**



1. A process for recovering petroleum from a subterranean reservoir penetrated by one or more injection wells and at least one production well spaced apart in the reservoir, which comprises injecting through at least one of said injection wells and into said reservoir an oil-in-water emulsion of a crude petroleum and a dilute aqueous solution of alkaline alkali metal silicate having a molar ratio of M_2O/SiO_2 of 1 or above wherein M is an alkali metal atom, and thereafter injecting a series of small slugs of (1) a dilute aqueous solution of said alkaline alkali metal silicate, (2) water, (3) a dilute aqueous solution of a water-soluble material that reacts with the alkaline alkali metal silicate to form a precipitate, and (4) water; repeating steps 1 through 4 a plurality of times; and recovering petroleum from said production well.

3,871,454

WATER FLOOD PROCESS IN CLAY-BEARING SUBSURFACE FORMATIONS

William M. Harrison, 364 Chevy Chase, Houston, Tex. 77478

Continuation-in-part of Ser. No. 100,363, Dec. 21, 1970, abandoned. This application May 3, 1973, Ser. No. 356,829

Int. Cl. E21b *43/22*

U.S. Cl. 166—275 **5 Claims**

1. In the method for improving the production of oil from an oil-producing formation containing bentonitic clays by injecting water flood materials into a bore hole connecting the oil-bearing formation with the surface of the earth, the improvement which comprises, injecting the water flood material containing an effective amount to prevent swelling and disintegration of clay in the formation but not more than about 0.1 percent by volume, with respect to water in the water flood material, of a sulfonated carbohydrate.

3,871,455

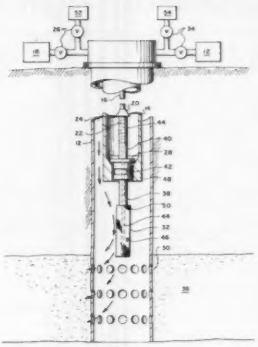
METHOD OF FORMATION CONSOLIDATION

William C. Hardy, Richardson; Edward F. Schultze, Dallas, and John C. Shepard, Richardson, all of Tex., assignors to Sun Oil Company (Delaware), Dallas, Tex.

Division of Ser. No. 189,854, Oct. 18, 1971, Pat. No. 3,812,913. This application Oct. 25, 1973, Ser. No. 409,488

Int. Cl. E21b *33/138, 43/24*

U.S. Cl. 166—288 **5 Claims**



1. In a formation comprising unconsolidated material penetrated by a wellbore and well pipe therein, the process of consolidating such material to prevent its encroachment into the wellbore comprising:

a. locating adjacent to the formation to be consolidated a catalytic heater having a fluid flow channel therein wherein a hydrocarbon containing fuel gas is flowed down the well pipe into contact with the fluid flow channel of the catalytic heater and an amount of oxidizing gas containing an amount of oxygen essentially greater than that needed to react with said fuel gas is flowed down an annulus between the well pipe and the wellbore whereupon the fuel gas and a portion of the oxygen in said oxidizing gas react thereby providing heat,

b. flowing the excess portion of said oxygen containing gas past said heat source and into said formation to initiate combustion of the formation fluids in situ continuing as long as the oxygen supply is continued,

c. ceasing the flow of said oxygen containing gas,

d. withdrawing said heat source,

e. bonding said heated formation with a substance which acts as a bonding agent when subjected to heat in said formation,

f. relocating said heat source adjacent to said formation

g. contact heating a non-oxidizing gas with said heat source and injecting it into said formation at a rate sufficient to insure permeability of said formation and to enhance the curing of said bonding agent.

3,871,456

METHODS OF TREATING WELLS

Phillip S. Sizer, Dallas, and Carter R. Young, Lewisville, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

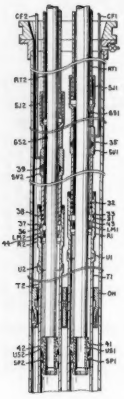
Division of Ser. No. 210,727, Dec. 22, 1971,. This application Mar. 23, 1973, Ser. No. 344,363

Int. Cl. E21b *23/00, 29/00, 43/00*

U.S. Cl. 166—298 **31 Claims**

1. A method of treating a well having a producing flow conductor in place therein to provide a surface controlled subsurface safety valve in said flow conductor for controlling flow through said conductor which includes: plugging the

producing flow conductor at a predetermined point below the surface to close off flow from the well therethrough; selecting a desired location in the flow conductor below the surface for parting the flow conductor; parting the flow conductor at such location; removing the parted upper portion of the conductor from the well; inserting a replacement upper flow conductor portion having a surface controlled normally closed subsurface safety valve therein in the well in flow communication



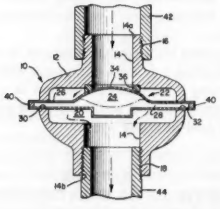
with the portion of the original flow conductor left in place in the well below the point of parting for controlling flow through said original flow conductor and through said replacement portion; unplugging the flow conductor below the safety valve; and controlling operation of said surface controlled subsurface safety valve from the surface in response to predetermined undesired conditions in the well or at the surface to close off flow through the flow conductor.

3,871,457

FLUID CONTROL DEVICE AND A FIRE PROTECTION SYSTEM INCORPORATING SAID DEVICE

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Mar. 4, 1974, Ser. No. 447,673
Int. Cl. A62c *37/06*
U.S. Cl. 169—20 **4 Claims**



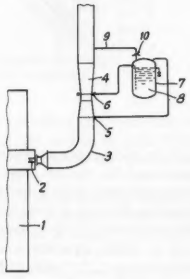
1. A fluid control device comprising a body having a passage therethrough between an inlet adapted to be connected to a source of fluid under pressure and an outlet adapted to be connected to a head for discharging said fluid; a movable member normally blocking said passage and having one side exposed to fluid pressure in said passage; means including said movable member for defining a closed chamber for containing a pressurized fluid, said pressurized fluid normally forcing said movable member into said passage blocking position, said movable member adapted to move from said passage blocking position in response to the fluid pressure in said passage exceeding a predetermined value sufficient to overcome the force of said fluid in said chamber, to permit the fluid in said passage to flow to said head for discharge; and means responsive to the presence of a predetermined temperature in the vicinity of said body member to permit the escape of said fluid from said chamber and permit said movable member to be forced from said passage blocking position by the fluid in said passage, regardless of the pressure of said latter fluid.

3,871,458

DEVICE FOR SUPPRESSING THE IGNITION OR EXPLOSION OF ESCAPING COMBUSTIBLE GASES UNDER HIGH PRESSURE

Eugene Dumazet, Ste Catherine-les-Arras, France, assignor to Societe Ethylene Plastique, Courbevoie, France

Filed Dec. 8, 1972, Ser. No. 313,420
Claims priority, application France, Dec. 14, 1971, 71.4490
Int. Cl. A62c *3/00*
U.S. Cl. 169—45 **5 Claims**



1. A device for suppressing the ignition or explosion of a combustible gas escaping under pressure from a high pressure ethylene polymerization reactor, which comprises a pressure-relief valve for venting combustible gas under pressure from said reactor, a duct connected to said pressure-relief valve to receive said combustible gas, a venturi in said duct, a reservoir for a combustion-suppressing fluid, and conduit means for connecting the venturi to the said duct both upstream of and at the divergent section of said venturi, in relation of the gas flow, in such a way that the pressure differential produced by the passage of the gas through the venturi forces fluid out of the said reservoir into the path of the said gas in the said duct.

3,871,459
METHOD AND A DEVICE FOR COMBATING SODIUM FIRES

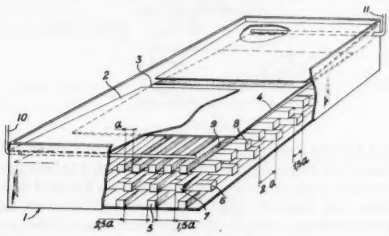
Michel Falgayrettes, 6 Les Sarments, 04 100 Manosque; Robert Pontier, Beliver, Traverse Malakoff, and Michel Sauvage, Parc Laurana, Traverse Malakoff, both of 13 100 Aix-en-Provence, all of France

Filed May 9, 1973, Ser. No. 358,820

Claims priority, application France, May 18, 1972, 72.17908

Int. Cl. A62c *3/00*

U.S. Cl. 169—49 **13 Claims**



1. A method of combating sodium fires, wherein the burning sodium is subjected simultaneously to confinement within an enclosure which reduces the oxygen supply and to powerful cooling by contacting the sodium within said enclosure with a heat sink which absorbs a large quantity of heat.

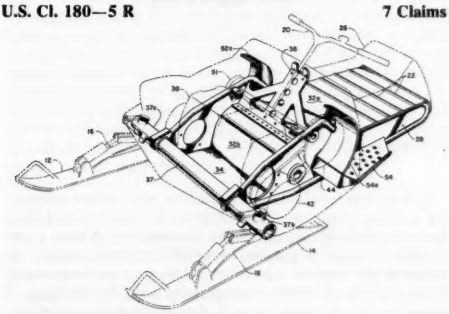
3,871,460
SNOWMOBILE FRAME

Douglas K. Dehnert, Thief River Falls, Minn., assignor to Arctic Enterprises, Inc., Thief River Falls, Minn.

Filed Oct. 23, 1973, Ser. No. 408,470

Int. Cl. B62d *27/02*

U.S. Cl. 180—5 R **7 Claims**



1. In a snowmobile having a forward portion substantially supported by steerable ski means attached to said forward portion, a rear portion having a seat and being supported by a suspension system including a ground-engaging endless drive tread and a forwardly located engine compartment, an improvement in a body frame comprising:

a pair of spaced-apart elongated side panels, each side panel extending longitudinally in a single plane along the rear portion of said snowmobile and along the forward portion thereof to a point approximately in line with the attachment of said ski means to said forward portion, each of said side panels including a stiffening member around the periphery thereof, a transverse panel extending laterally between said side panels, said transverse panel having a rearward portion disposed between rear portions of said side panels for supporting said seat and having a forward portion for separating said engine compartment from said drive tread area while forming the bottom of said engine compartment, and a drive clutch assembly operatively mounted directly on one of said side panels.

3,871,461
STEERING DRIVE MECHANISMS

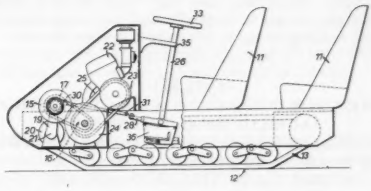
Josef Ehrlich, Bridgewater House, Ashridge near Berkhamstead, Hertfordshire, England

Filed Feb. 23, 1973, Ser. No. 335,334

Claims priority, application United Kingdom, Feb. 25, 1972, 8831/72

Int. Cl. B62d *11/06*

U.S. Cl. 180—6.2 **11 Claims**



1. A drive mechanism comprising:

a drive input;

left and right drive output wheels;

a first belt and pulley drive for said left drive output wheel; a second belt and pulley drive for said right drive output wheel;

each of said first and second belt and pulley drives having a drive pulley coupled to said drive input, a driven pulley, a belt connecting said drive pulley and said driven pulley and drive coupling means for coupling said driven pulley to its respective output wheel;

each of said driven pulleys being mounted on an arm radial of its respective output wheel;

means for infinitely varying the drive ratio of at least one of said first and second belt and pulley drives; and

steering control means for operation by a user to operate said infinitely variable ratio drive means by varying the distance of the driven pulley from the driving pulley in said at least one of said first and second belt and pulley drives, by a turning movement of said radial arm about the axis of the respective output wheel.

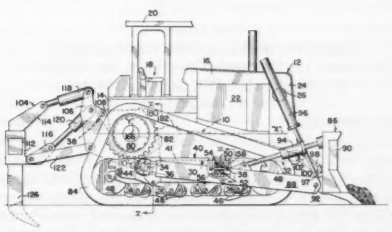
3,871,462
VEHICLE MAIN FRAME

Ronald L. Krolak, Metamora; Albert Gianessi, East Peoria, and George F. Alexander, Pekin, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 5, 1973, Ser. No. 338,314

Int. Cl. B62d *55/02*

U.S. Cl. 180—9.5 **14 Claims**



1. A vehicle main frame having a longitudinal axis subjected to relatively high loads in a pair of spaced essentially vertical

planes disposed substantially parallel to such a frame axis and supported by ground-engaging means through pivot support bearing means, comprising;

housing means having an axis oriented transversely of said frame axis and having outwardly disposed opposite ends; and

a pair of elongated sidewalls disposed in laterally spaced substantially parallel relation individually rigidly secured in completely marginally contacting fully embracing relation to said opposite ends of said housing means and having extended portions spaced outwardly from said housing means within said planes to provide a mounting for such pivot support bearing means about which the frame is permitted to pivot relative to the ground-engaging means during vehicle travel and for substantially directly transmitting said high loads to such ground-engaging means in generally load-bypassing relation to said housing means to minimize distortion thereof.

3,871,463

DEVICE FOR CONNECTING A TRACTOR WITH AN AGRICULTURAL IMPLEMENT

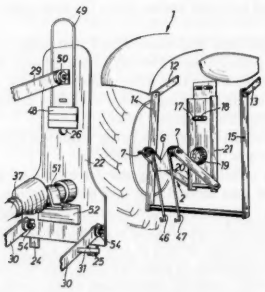
Hubert Geisthoff, Lohmar, Germany, assignor to Jean Walterscheid GmbH, Siegburg-Lohmar, Germany

Filed Aug. 21, 1973, Ser. No. 390,198

Claims priority, application Germany, Aug. 23, 1972, 2241434

Int. Cl. B60d *1/08*

U.S. Cl. 180—14 B **18 Claims**



1. In a device for connecting an agricultural implement to a tractor, the combination of a mounting plate on the implement, catch arm means on said tractor for engaging such implement mounting plate, vertical and horizontal alignment means on said catch arm means, said mounting plate having alignment means thereon engagable with said catch arm alignment means for aligning said implement mounting plate with respect to said tractor, and means on said tractor and mounting plate for coupling said mounting plate to said tractor.

3,871,464

SELF-PROPELLED GOLF BAG CART

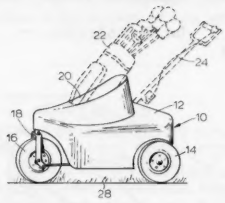
John W. Eden, 1101 Farquhar Dr., York, Pa. 17403

Filed Sept. 12, 1973, Ser. No. 396,347

Int. Cl. B62d *51/06*

U.S. Cl. 180—19 S **7 Claims**

1. A power driven cart to carry a golf bag and steered manually by a person walking rearwardly of said cart, said cart comprising in combination, a frame having means to support a golf bag, a pair of wheels rotatably connected to the rear portion of the frame at opposite sides thereof, power means carried by said frame and interconnected to said wheels to drive the same uni-directionally, yoke means supported by the forward end of said frame within a substantially vertical bearing, a steering wheel supported by said yoke, a steering arm pivotally supported by said frame adjacent the rearward end thereof and having a manually engageable handle extending rearwardly therefrom, linkage means connected between said yoke and said steering arm to effect turning of said front wheel by movement of said rearwardly extending steering arm; and steering control means connected to said steering arm and comprising a centering arm extending outwardly relative to



the pivot for said steering arm, and spring means connected to said frame and engaging said centering arm to bias the same in a direction to direct said steering wheel in a forward direction when said manually engageable handle is released, said spring means being placed under increased tension when said steering wheel is turned from a forward direction, whereby said increased tension causes said spring to move said centering arm and steering wheel as aforesaid.

3,871,465

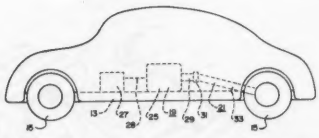
VEHICLE WITH VERTICALLY MOVABLE POWER WHEELS

Frank R. Nichols, deceased, late of 162 N. Holmes, Memphis, Tenn. 38111 (by Pauline Harris Nichols, executrix)

Filed Nov. 10, 1972, Ser. No. 305,490

Int. Cl. B62d *61/12*

U.S. Cl. 180—24.02 **3 Claims**



1. A vehicle for travel over a roadway, said vehicle comprising: a chassis, support wheels rotatably mounted on said chassis for supporting said vehicle on the roadway, at least a pair of power wheels adjustably mounted from said chassis for substantially vertical movement relative to said chassis to allow variable frictional engagement with the roadway, a motor means mounted on said chassis, coupling means between said motor means and said power wheel for transmitting power from said motor means to said power wheels, and means for variably forcing said power wheels into frictional engagement with the roadway to provide the needed traction to move said vehicle while said vehicle is substantially supported by said support wheels thereby reducing the power needed to move said vehicle to a minimum; said coupling means comprising a universal joint attached to the output shaft of said motor means for allowing relative movement between said motor means and said pair of power wheels, a drive shaft attached to said universal joint opposite the output shaft of said motor means, differential means attached to said drive shaft opposite said universal joint, and axle means attached to said differential means and to said pair of power wheels; said means for variably forcing said pair of power wheels into frictional engagement with the roadway comprising arm means pivotally attached to said chassis and to said

axle means, means for applying a force against said arm means, and means for activating said means for applying a force against said arm means; said means for applying a force against said arm means comprising a fluid piston means.

3,871,466

TRANSMISSIONS OF VEHICLES EQUIPPED WITH A RETARDER

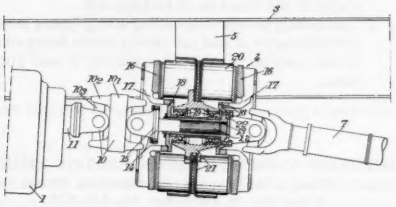
Pierre Etienne Bessiere, Golf Saint-nom-la-Breteche, France, assignor to Labavia S.G.E., Paris, France

Filed Dec. 4, 1972, Ser. No. 311,559

Claims priority, application France, Dec. 8, 1971, 71.44110

Int. Cl. B60k *33/00*

U.S. Cl. 180—70 P **8 Claims**



1. Vehicle transmission equipped with a retarder interposed between the gear box and the axle of this vehicle, in which the stator of the retarder is suspended from the chassis of the vehicle independently of the gear box and of the axle and in which the rotor of the retarder is coupled respectively to the output shaft of the gear box and to the input shaft of the axle through two homokinetic coupling assemblies, the rotor of the retarder comprising a cylindrical internally grooved sleeve open in the direction of the gear box and mounted inside bearings borne by said stator and bearing respectively at its two axial ends two plates each bearing an induction disc through a crown of fins fixed at the periphery of the plate, the plate arranged on the side of the axle being bolted to a plate which forms part of the homokinetic coupling assembly arranged between the retarder and the axle, the homokinetic coupling assembly being situated between the gear box and the retarder and having a very small and invariable axial size, and an externally grooved stub shaft axially slidably engaged in said sleeve terminating said homokinetic coupling assembly on the side of the retarder.

3,871,467

INDEPENDENT WHEEL SUSPENSION FOR NON-STEERED WHEELS OF MOTOR VEHICLES

Ernst Senft, Moglingen, and Manfred Von der Ohe, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

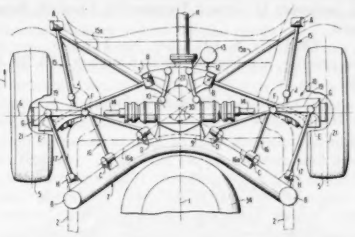
Filed Apr. 23, 1973, Ser. No. 353,644

Claims priority, application Germany, Apr. 24, 1972, 2220034

Int. Cl. B60g *3/18*

U.S. Cl. 180—73 C **60 Claims**

1. An independent wheel suspension for motor vehicles which includes guide means and wheel carrier means guided as couplers by said guide means, track link steering lever means connected with the wheel carrier means and extending substantially in a vehicle vertical transverse plane, and track rod means pivotally connected with the track link steering lever means in a point of pivotal connection that extends in a plane approximately parallel to the plane of a respective one of said guide means, characterized in that the track rod means with its point of pivotal connection at the track link steering lever means is located at least at approximately the same height as the point of pivotal connection of said one guide means at the wheel carrier means, and in that the track rod means is pivotally connected with its point of pivotal connection opposite the track link steering lever means within the area of the axis of rotation of said one guide means.



3,871,468

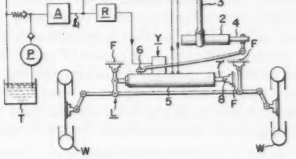
COURSE CONTROLLING DEVICE FOR A VEHICLE

Kimio Miura, Sakado-Machi, Saitama-ken, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1973, Ser. No. 405,655

Int. Cl. B62d *5/08, 5/10*

U.S. Cl. 180—79.2 R **2 Claims**

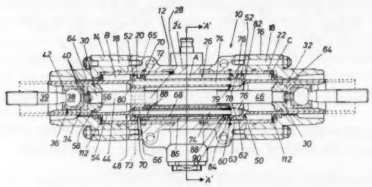


1. A course controlling device for a vehicle having steerable road-engaging wheels, comprising hydraulic actuator means operable to turn the steerable wheels of the vehicle, said hydraulic actuator means including an oil hydraulic cylinder having an oil hydraulic chamber therein, a piston slidably accommodated in said chamber and defining therein a pair of left and right spaces; a source of pressure oil; oil lines communicating between said source of pressure oil and said left and right spaces of said chamber; a course change detector means for detecting any change in course of the vehicle; control valve means comprising a spool valve, said spool valve being disposed in said oil lines between said source of pressure oil and said left and right spaces for selectively placing the former in communication with either of the latter; a first pressure receiving region including a piston formed integrally with said spool valve and a pair of left and right fluid spaces defined by said last-mentioned piston on opposite sides thereof, said fluid spaces being disposed on the output side of said course change detector means so as to receive pressure oil from the latter in respective amounts varying with the detected course change of the vehicle; a second pressure receiving region including a thrust element formed integrally with said spool valve, and a steering force transmitting member operably connecting said thrust element with the steering wheel of the vehicle so as to transmit a steering force from the steering wheel to said thrust element, said oil hydraulic cylinder incorporating therein said control valve and said first and second pressure receiving regions each in coaxial relation therewith, whereby said control valve means is operable under a pressure differential produced between said first and second pressure receiving regions to control said hydraulic actuator means.

3,871,469
STEERING MECHANISMS

Barry J. Millard, and Leslie R. Jenvey, both of Reading, England, assignors to Adwest Engineering Limited, Reading, England

Filed Nov. 6, 1973, Ser. No. 413,396
Claims priority, application United Kingdom, Oct. 20, 1972, 48407/72
Int. Cl. B62d *3/12, 5/10*
U.S. Cl. 180—79.2 R **5 Claims**

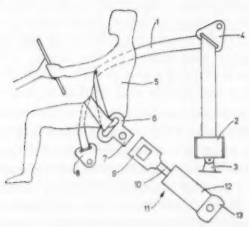


1. In a rack-and-pinion steering mechanism suitable for steering one set of steerable road wheels of a motor vehicle having two such sets, an elongate housing, a pinion rotatably mounted in the housing and connectable with the steering control of a motor vehicle for rotation thereby, a link member extending longitudinally of the housing, the link member being movable longitudinally relative to the housing and the opposite ends of the link member being connectable to a set of steerable road wheels for imparting steering thereto, a toothed rack in constant mesh with said pinion and mounted for longitudinal sliding movement in said housing, and selectively operable means for selectively connecting the toothed rack to said link member so that longitudinal movement imparted to the toothed rack by rotation of said pinion will be transmitted to the link member or locking the link member in a centralized position and freeing the toothed rack for longitudinal movement relative to the link member while maintaining meshing engagement between the rack and the pinion.

3,871,470
SAFETY BELT TENSIONING DEVICE

Wilfried Schwanz; Ernst Fiala, both of Braunschweig; Rolf Warnecke, Ribbesbuttel, and Peter Buchholz, Braunschweig, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Oct. 24, 1972, Ser. No. 299,783
Claims priority, application Germany, May 12, 1972, 2223061
Int. Cl. B60r *21/10*
U.S. Cl. 180—82 C **3 Claims**



1. Apparatus for tensioning a restraining device when actuated, comprising, in combination:

a. piston means;

b. cylinder means, surrounding said piston means, for applying a force to cause said piston means to move therein upon actuation, said cylinder means including a propellant charge for applying said force when released, said cylinder means being further provided with at least one discharge opening for controlling the velocity of said piston means;

c. actuatable sensor means for releasing said propellant charge when actuated;

d. intermediate means including a piston connecting rod, connecting said piston means to the restraining device, for tensioning the restraining device upon movement of said piston; and

e. return stop means acting directly on said piston means for maintaining tension in the restraining device after tensioning by said intermediate means, said return stop means including:

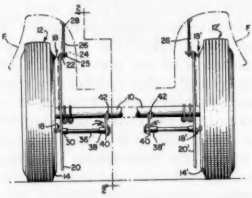
1. at least two gripping jaws surrounding said connecting rod, the outer diameter of said gripping jaws being conically tapered such that said outer diameter is reduced in the direction of locking, and

2. jaw closing means surrounding said gripping jaws, the inner diameter of said jaw closing means being adapted to the contour of said outer diamter of said gripping jaws.

3,871,471
AUXILIARY SYSTEM FOR DECELERATING VEHICLE

Walter C. Wong, 1104 Pensacola St., Honolulu, Hawaii 96814

Filed Mar. 9, 1973, Ser. No. 339,575
Int. Cl. B60t *1/04*
U.S. Cl. 180—82 R **12 Claims**

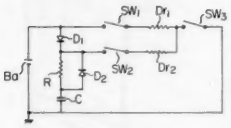


1. An auxiliary system for decelerating a motor vehicle in imminent danger of collision, said system being operable to supplement the braking effect of the vehicle's brakes, said system comprising one or more wheels having a pneumatic tire equipped with laterally inwardly extending valve means on the inner sidewall thereof, deflating means movably supported on said vehicle laterally inwardly of said valve means, shifting means normally restraining said deflating means out of engagement with said valve means and upon being actuated urging said deflating means into engagement with said valve means to reduce pressure of said tire upon actuation of said shifting means by command means by the operator of the vehicle, said valve means comprising two or more circumferentially spaced valves each having a laterally inwardly directed valve stem and a tubular housing around said stem and terminating short of the free end of said stem, said deflating means comprising an annular plate member supported for movement laterally of the vehicle into and out of engagement with said valves, and upper support means for said annular plate member including an L-shaped bracket fixedly secured to said plate member and formed with a laterally extending guide slot through which extends a rod in supporting relationship with said bracket.

3,871,472
ACTUATOR OF MOTOR VEHICLE SAFETY DEVICE

Akio Hosaka, and Shunji Matsui, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Feb. 22, 1973, Ser. No. 334,623
Claims priority, application Japan, Feb. 23, 1972, 47-21616
Int. Cl. B60r *21/10*
U.S. Cl. 180—103 **2 Claims**

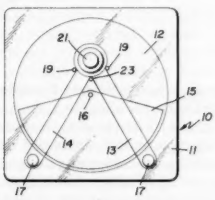


1. An actuator of safety devices for a motor vehicle comprising:
   a main DC power source;
   a first series circuit connected across said power source and formed by an instant impact responsive collision sensor which is connected to a first electrically actuable detonating means;
   a second series circuit connected in parallel with said first series circuit and formed by a delayed-action impact responsive collision sensor which is connected to a second electrically actuable detonating means; and
   an auxiliary power source for actuating said second detonating means and comprising a first diode connected between one terminal of said main power source and said second series circuit, a series connection formed by a resistor having one terminal connected to a junction between said one terminal of said main power source and said first diode and a capacitor connected between the other terminal of said resistor and the other terminal of said main power source, and a second diode having one terminal connected to the other terminal of said resistor and with the other terminal of said second diode being connected to a junction between said first diode and said delayed-action impact responsive collision sensor.

3,871,473
SWITCH

Leon H. Castonguay, Wheelright, Mass., assignor to Astratronics, Inc., Wheelwright, Mass.

Filed May 1, 1972, Ser. No. 249,060
Int. Cl. B06k *27/08*
U.S. Cl. 180—104 **4 Claims**



1. A vehicle safety system, comprising:
   a. a vehicle,
   b. a motor having an electrical system, said motor being adapted to drive said vehicle,
   c. an attitude-sensitive switch located in said electrical system rigidly mounted in the vehicle, and residing in a first state when the switch is positioned in a usual attitude with respect to a horizontal reference plane, but being transferred to a second state when the attitude of the switch assumes a predetermined deviation from said usual attitude, said second state involving an interuption of said electrical system to shut off said motor
   d. holding means adapted to retain the switch in said second state regardless of the subsequent attitude of the switch,
   e. releasing means adapted to inactivate for a time the ability of the holding means to retain said switch in said second state, and
   f. retaining means adapted to allow the switch to move from its first state only if the switch assumes said deviation, wherein a channel is provided with a first and a second end, wherein a contactor is provided movable in the channel, and wherein the retaining means includes a pendulum which can swing into the channel and thereby restrict movement of the contactor.

3,871,474
ELECTRIC AUTOMATIC DOOR LOCKING SYSTEM

Patrick W. Tomlinson, Warren, Mich.; James P. Chandler, Huntsville, Ala., and Mark W. Scott, Sterling Heights, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

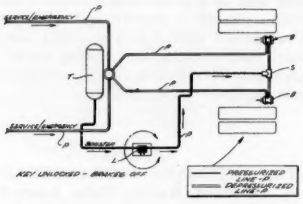
Filed June 6, 1973, Ser. No. 367,604
Int. Cl. B60r *21/02*
U.S. Cl. 180—112 **5 Claims**

1. In a motor vehicle having a plurality of doors with each door being provided with door latching and locking mechanism, an electric automotive door locking system comprising:
   a source of power;
   a solenoid control unit operatively connected to the door locking mechanism at each door of the vehicle, said solenoid control unit being responsive to an electrical signal for actuating the door locking mechanism;
   an AND circuit formed by a first switch responsive to weight on a vehicle seat corresponding to the driver's position, a second switch responsive to engagement of the vehicle transmission into a drive position, a third switch responsive to running of the vehicle engine and a fourth switch responsive to closing of the vehicle doors, each of said first, second, third and fourth switches being operative to supply a ground voltage signal;
   a logical control unit electrically responsive to said AND circuit for generating said electrical signal applied to each of said solenoid control units; and
   an override control for electrically actuating the door lock mechanism regardless of the state of said AND circuit;
   said logical control unit comprising:
   a first transistor having its emitter-collector circuit electrically connected with said AND circuit so as to be capable of coupling said AND circuit with said source of power;
   a second transistor electrically connected with said solenoid control unit so as to be capable of connecting said source of power to said solenoid control unit; and
   a capacitor having one side thereof connected with said first transistor and its other side connected with said second transistor, said capacitor being responsive to a voltage level change from ground for causing said second transistor to energize said solenoid control unit.

3,871,475
MOTOR VEHICLE SECURITY SYSTEM AND SECURITY METHOD

Billy E. Stevenson, Huntington Beach, and Thomas R. Rumsey, Inglewood, both of Calif., assignors to Royal Industries, Inc., Pasadena, Calif.

Division of Ser. No. 181,673, Sept. 20, 1971, Pat. No. 3,770,324. This application July 19, 1973, Ser. No. 380,588
Int. Cl. B60k *27/00*
U.S. Cl. 180—113 **8 Claims**



1. A motor vehicle security system comprising

a vehicle having a plurality of wheels and at least one door, a source of pressurized air, controllable braking means coupled to the source of pressurized air, said braking means including mechanically powered alternate brake setting means coupled to the source of pressurized air and maintained in a deactuated brake setting condition in response to the application of pressurized air thereto and effective to automatically set the braking means upon failure of the pressurized air, said mechanically powered braking means including means for preventing the unauthorized operation of the braking means at said braking means,

controllable locking means arranged on the motor vehicle and connected to control the locking and unlocking of at least the single door for the motor vehicle,

lockable valve means coupled to said source of pressurized air and being manually operable to a locked condition for setting the mechanically powered brake setting means and locking same in the set position,

said door locking means being coupled to the source of pressurized air through the lockable valve means to be placed in a locked and unlocked position by the corresponding operation of the lockable valve means, and

control means accessible within the motor vehicle and coupled between said source of pressurized air and the locking means for controlling the application of the source of pressurized air to said locking means.

3,871,476
SKIRT FOR AIR CUSHION VEHICLE

Walter A. Crowley, Rt. 1, Box 3352, Oak Harbor, Wash. 98277

Filed Oct. 2, 1972, Ser. No. 294,334
Int. Cl. B60v *1/02, 1/16*
U.S. Cl. 180—127 **5 Claims**

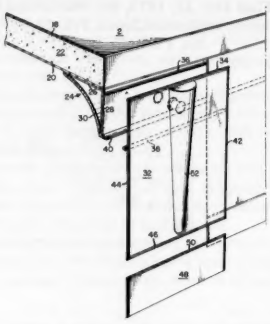
1. A skirt for use in an air-cushion vehicle having a main body portion comprising:

a plurality of flexible, depending segments secured around the periphery of the main body of the vehicle and thus serving as the sides of the plenum,

means for removably securing the segments together to form a continuous closed skirt,

means for removably, individually securing each segment to the periphery of the main body portion, and

means on each segment of the skirt and in fluid communication with the source of air under pressure to selectively rigidify each segment while still allowing sufficient flexibility to allow the vehicle to pass over upwardly projecting objects without damage.

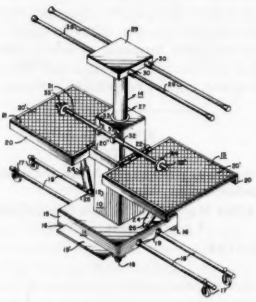


3. A skirt as in claim **1** wherein the means for removably securing the segments together comprises respective zippers extending substantially the full length of the contiguous edges of adjacent segments.

3,871,477
SHEETROCK LIFT AND SCAFFOLD

Johnnie Kuest, P.O. Box 1254, Twin Falls, Idaho 83301

Filed Feb. 7, 1974, Ser. No. 440,424
Int. Cl. B66f *9/12;* **E04g** *1/18*
U.S. Cl. 182—63 **6 Claims**



1. A combination scaffold and lift comprising:

a truck provided with suitable casters and balance arms being in contact with the floor to stabilize said truck;

a pedestal issuing upwardly from said truck;

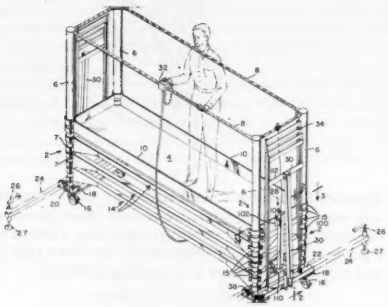
a platform issuing from opposing sides of said pedestal over said balance arms, said platform being freely slidable along said pedestal and being provided with means for raising and lowering said platform with respect to said pedestal;

and a lift assembly including a lift column carried in said pedestal and including means for raising and lowering, said lift column with respect to said pedestal, and having lift arms issuing from opposing sides of a bracket at the uppermost terminal end of said lift column.

3,871,478
EXTENDIBLE STABLE WORKING PLATFORM

Sherman W. Bushnell, Jr., 2924 Western Ave., Seattle, Wash. 98121

Continuation-in-part of Ser. No. 190,052, Oct. 18, 1971, abandoned. This application Nov. 24, 1972, Ser. No. 309,474
Int. Cl. E04g 1/22
U.S. Cl. 182—63 46 Claims



1. An elongated rectangular working platform secured to four extendible telescoping cylinders, one at each corner, having an inherently stable base, said base comprising;

framework rigidly interconnecting two of the lower cylinders,

a vertical rigid upright member parallel to the cylinders secured to the framework,

extendible bracing means pivotally secured to the upright member adapted to be extended to contact the floor at an angle to the cylinders providing a rigid base, and

means rigidly interconnecting the lower section of the bracing means with the framework, pivotally mounted to both the framework and the bracing means whereby the interconnecting means may be pivoted upwardly, collapsing the bracing means against the framework, and

telescoping outrigger means mounted for horizontal extension in the same direction as the axis of the framework to provide a broader, more stable base.

3,871,479
TELESCOPING STAIRWAY

Clarence H. Pelto, 80 Duboce Ave., San Francisco, Calif. 94103

Filed July 13, 1973, Ser. No. 379,092
Int. Cl. E06c 1/38
U.S. Cl. 182—86 3 Claims

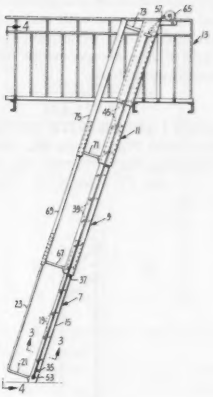
1. A compact and rugged telescoping stairway comprising in combination:

a. A first, elongate bottom stairway section comprising a pair of substantially parallel, spaced apart U-shaped channel members with their open sides facing each other and having a plurality of treads in fixed relationship between said channel members,

b. a second section mounted above said first section, said second section including a pair of spaced apart, substantially parallel U-shaped channel members of slightly larger size than the channel members of the first section, whereby the channel members of the first section can telescope within the second section,

c. the channel members of the second section each consisting of a center web section with front and rear flanges attached thereto,

d. a plurality of tread members mounted between said second channel members, the ends of said tread members extending between said flanges, pivot means on each of said tread members pivoting said tread member at a point adjacent the front flanges and the rear of the tread member being free, whereby each of said tread members can lie in a first position parallel to and closely adjacent to the front flanges and can rotate to a second position wherein the tread member rests directly at an end portion thereof on the rear flanges and is directly supported thereby, whereby,

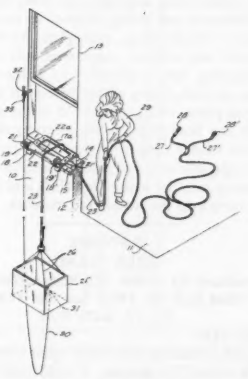


e. said first section can telescope into said second section pushing the tread members of the second section from the second position wherein the rear surfaces of the tread members are supported directly by the rear flanges to the first position wherein the tread members lie parallel to the front flanges.

3,871,480
SAFETY AND ESCAPE MECHANISM

Richard Sauri, 85-18 118th St., Kew Gardens, N.Y. 11415

Filed Apr. 17, 1974, Ser. No. 461,524
Int. Cl. A62b 1/02
U.S. Cl. 182—100 14 Claims



1. A safety mechanism for escape from buildings via above ground windows comprising in combination a guide roller having bracket means for securing the same parallel to a windowsill in a manner to protrude outwardly therefrom, and a rope substantially longer than the windowsill to ground dimension, basket means at one end of said rope of a size to

receive infants and small children in lying or seated position and larger individuals in a kneeling or standing position whereby an able-bodied operator within the building can quickly lower one or more individuals to ground level by controlling feed of said rope over the windowsill and roller, the other end of said rope terminating in a pair of integral rope extensions having loops at the extermities thereof, and said roller having axial extensions at opposed ends thereof adapted to be engaged by said loops with said engagement being enhanced by the application of tension to said rope, thereby providing a safe sliding escape means for said operator and other able-bodied individuals.

3,871,481

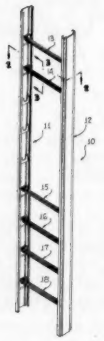
KNOCKDOWN LADDER WITH REMOVABLE RUNGS

William Balick, 2995 Woodhaven Rd., Macon, Ga. 31204

Filed Dec. 26, 1973, Ser. No. 427,628

Int. Cl. E06c *1/38, 7/50*

U.S. Cl. 182—151 **5 Claims**



1. A knockdown ladder particularly adapted for use with a different number of rungs depending upon the particular height to which a person desires to climb comprising a pair of elongated side rails adapted when in use to be disposed in an upright position, a plurality of plates secured to opposing inboard sides of each side rail, the plurality of plates being disposed in transversely aligned pairs along the length of said side rails with each pair being adapted to couplingly support therebetween a ladder rung, each plate having an upwardly opening notch and with its associated side rail defining an upwardly opening slot, a plurality of ladder rungs, a plate secured to each ladder rung at opposite ends thereof, and said rung and rung plates being contoured to the general shape of said notches and slots respectively whereby downward movement of each ladder rung relative to the side rails and any transversely opposite side rail plates results in the reception of said rung plates into the associated slots and the reception of said ladder rung into the associated notches.

3,871,482

TREE STAND

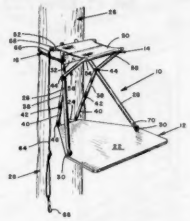
Benny S. Southard, Rt. 1, Box 711, Summerfield, N.C. 27358

Filed June 26, 1973, Ser. No. 373,689

Int. Cl. A47c *9/10*

U.S. Cl. 182—187 **9 Claims**

1. A portable, foldable tree stand upon which a hunter may stand or be seated comprising, a rigid base support means adapted to be positioned substantially horizontally in abutting relationship with the side of a tree, said base support means including a rigid platform, seat means pivotably mounted upon said base support means and located above said base support means when said tree stand is supported upon a tree and adapted to be collapsed against said base support means when transporting said tree stand, and elongated means adapted to be looped around said tree and adjustably secured to said seat means for supporting said tree stand upon said tree, said seat means including a pair of spaced rigid brace means and a pair of articulated brace means, said rigid and said articulated brace means being interconnected and pivotably mounted and securely fastened upon and cooperatively



displaceable relative to said rigid base support means and a seat member foldable relative to said brace means and said rigid base means from a position supporting a seated hunter to a position for exposing substantially the entire rigid platform and supporting a hunter in a standing position.

3,871,483

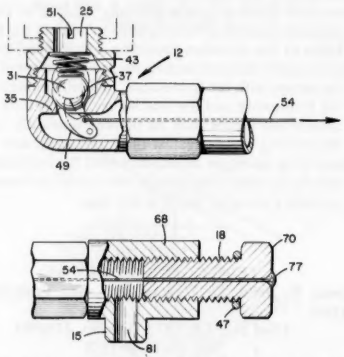
VEHICULAR DRAINAGE SYSTEM

Rene J. Espinosa, and Dominador Espinosa, both of 21 S. Stone Ave., La Grange, Ill. 60525

Continuation of Ser. No. 133,138, April 12, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,434

Int. Cl. F01m *11/04*

U.S. Cl. 184—1.5 **5 Claims**



1. A drainage system comprising a check or coupling valve attachable to a vehicular sump, said valve seated on a valve seat, a length of tubing attached at one end to the outlet side of the valve seat, a rotatable drain plug movably secured to the other end of said tubing, said other end of said tubing defining a drain hole, and a cable interconnecting said valve and plug through said tube, said plug closing said drain hole in the tubing when inactivated and simultaneously uncovering the drain hole and opening the valve when activated.

3,871,484

OIL MIST LUBRICATION AND OIL IMMERSION SYSTEM

Henry A. Thomas, 423 Castle Kirk Ave., Baton Rouge, La. 70808

Filed Aug. 2, 1973, Ser. No. 384,971

Int. Cl. F16n *31/00*

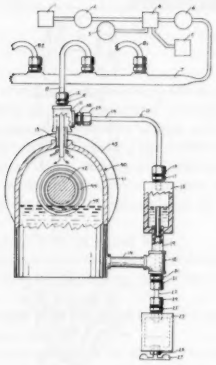
U.S. Cl. 184—6.26 **10 Claims**

1. Apparatus for use with an oil mist lubrication system for the lubrication of machine elements and the like wherein an

oil aerosol at above atmospheric pressure is conveyed via an aerosol supply conduit from said oil mist lubrication system, the combination which comprises:

a sealed housing, formed by an enclosing wall, within the confines of which there is mounted an end of a rotatable shaft which carries machine elements that are to be lubricated, a reservoir within the bottom of which an oil pool can be maintained at level sufficient that the lower portions of the machine elements can be partially immersed therein, and within which sealed housing an aerosol supply conduit is connected and in communication therewith for supply of oil aerosol at above atmospheric pressure to the housing,

a sealed closed loop conduit, one terminal end of which is connected to and in communication with the lower portion of the sealed housing below said oil level for supply of oil thereto, an intermediate portion at sufficient height above the bottom of the housing to permit an oil level to



be maintained therein, and the opposite terminal end of which is connected to and in communication with an upper portion of the housing above the oil level,

oil collection means in open communication with, and in sealed relationship with said closed loop conduit,

whereby, oil aerosol supplied under above atmospheric pressure can enter into the upper portion of the closed sealed housing and into the vapor space of the housing via the aerosol supply conduit and into the upper portion of the closed loop conduit, and oil is provided ingress and egress to and from the oil pool at the bottom of the housing, lower portion of the closed loop conduit and intermediate portion of said closed loop such that an above atmospheric equilibrium pressure can be maintained upon the oil level in both the housing, closed loop circuit and oil collection means, this preventing fluctuating oil levels and differential pressures between the said housing and closed loop circuit.

3,871,485

LASER BEAM DRILL

Bernard J. Keenan, Jr., West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Nov. 2, 1973, Ser. No. 412,240

Int. Cl. E21b *7/00*

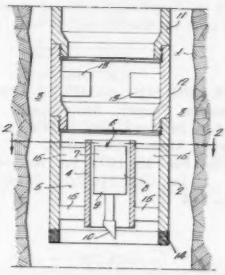
U.S. Cl. 175—16 **5 Claims**

1. A method for recovering liquid reserves from a subterranean formation through a borehole containing a drill string comprising

a. attaching a laser beam housing to the lower most section of the drill string,

b. positioning in said laser beam housing a self-contained and removable laser beam drill positioner,

c. positioning within said laser beam drill positioner a voltage generator and a laser beam generator electrically connected to and deriving its power from said voltage generator,



d. activating said voltage generator by drilling fluid passing through the drill pipe and

e. positioning a rotating beam reflecting crystal within the laser beam drill positioner whereby a beam projected from the laser beam generator is reflected across the face of the formation being drilled.

3,871,486

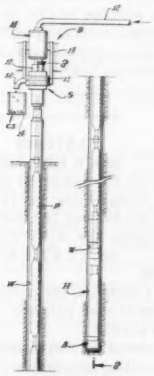
CONTINUOUS CORING SYSTEM AND APPARATUS

Alfred R. Curington, and Theodore J. Roscoe, Jr., both of Houston, Tex., assignors to Bakerdrill, Inc., Spartanburg, S.C.

Filed Aug. 29, 1973, Ser. No. 392,628

Int. Cl. E21b *1/06, 3/08, 5/00*

U.S. Cl. 175—100 **20 Claims**



1. In a system for continuously taking core samples from the bottom of a well bore while drilling the well bore: a dual drill pipe string extending into the well bore, an airhammer and percussion bit at the bottom of the drill pipe string, a swivel at the top of the drill pipe string connectable to a source of air under pressure, and means for rotating the drill string, said drill pipe string having one pipe for conducting air from the swivel to said airhammer and another pipe for conducting core samples from said percussion bit to said swivel, said swivel having means for conducting air to said one pipe and receiving said core samples from said another pipe, said air-

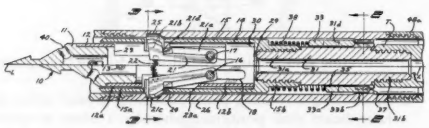
hammer having air operated hammer piston means and control means for reciprocating said hammer piston means, said percussion bit having an anvil engageable by said piston means upon reciprocation of the latter, cutting elements on said bit for drilling into the formation at the bottom of the well bore, including core cutting means at the center of the bit, and means for directing a major portion of the air supplied to said airhammer to actuate said piston means and thence exhaust to the well bore for flushing cuttings therefrom and a minor portion of the air supplied to said airhammer to said another pipe to carry core samples to said swivel.

3,871,487

WIRE LINE SOIL SAMPLER APPARATUS

Jamshed Rustom Cooper, Minneapolis, and Walter W. Svendsen, New Brighton, both of Minn., assignors to Longyear Company, Minneapolis, Minn.

Filed Feb. 25, 1974, Ser. No. 445,643
Int. Cl. E21b *9/20, 25/00*
U.S. Cl. 175—248 **22 Claims**



8. For use in a drill stem having an axially outer end, an axially inner bit end and a latch seat adjacent the bit end that has an axially inwardly facing shoulder, wire line soil sampling apparatus comprising an axially elongated latch body having a tubular axially outer end portion, said latch body outer end portion having a latch slot opening transversely therethrough, a latch release member having a tubular portion axially slidably extendable into the latch body tubular portion, said latch release tubular portion having a latch retracting slot and opposed, axially elongated pivot member slots, a transverse pivot member mounted by the latch body and slidably extended through the pivot member slots to limit the axial movement of the latch release member relative to the latch body, and a latch pivotally mounted on the pivot member for movement between a latch seat engaging position extending through the latch body slot and the latch retracting slot, and a latch retracted position.

3,871,488

ROCK DRILLING

Daniel R. Sabre, c/o The Industrial Automation Co., 1520 N. Palethorpe St., Philadelphia, Pa. 19122

Continuation of Ser. No. 442,181, Feb. 13, 1974, abandoned. This application Apr. 4, 1974, Ser. No. 457,793
Int. Cl. E21b *9/22*
U.S. Cl. 175—406 **10 Claims**

1. In an earth cutting bit, the combination of:

a vertically aligned shaft portion;

a drilling head portion;

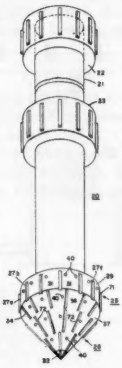
a vertical cylindrical portion in said drilling head;

a plurality of cutting members secured to said cylindrical portion to provide knife-like cutting edges having a generally vertical direction, the arcual distances between cutting members being greater than 5 millimeters, said distances being adapted to minimize the likelihood of malign vibration during rotation of the bit, said cutting members having relatively hard composition;

vertically aligned debris channels between the cutting members on the cylindrical portion, said debris channels accommodating the flow upwardly of a stream of fluid containing entrained debris removed in drilling the hole, there being an effluent zone from the debris channels at the upper portion of said cylindrical portion each cross section of a debris channel comprising two sidewalls and a connecting surface;

a conical portion beneath said vertical cylindrical portion in said drilling head the tip of such conical portion being bottommost and coaxial with the entire bit, the maximum diameter of the conical portion being integral with the bottommost portion of the cylindrical portion;

cutting members on the conical portion, said cutting members having knife-life cutting edges, there being fewer cutting members near the conical tip than near the cylindrical portion of the bit, the rotation of said conical portion enhancing the propensities of said bit to drill a vertical hole notwithstanding variations in the formations penetrated by the bit, the arcual spacing between the cutting members being greater than 5 millimeters, the



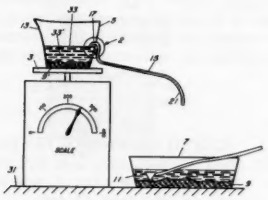
distances between cutting members being adapted to decrease the likelihood of malign vibration and the zones between cutting members being conically aligned debris channels, there being more debris channels at the upper portion of the conical portion than at the tip, the upper portion of the system of conically disposed debris channels feeding streams of fluid containing entrained debris to the system of debris channels on the cylindrical portion;

a plurality of ports within the debris channels, said ports being adapted to direct jets of fluid for urging debris generally upward toward the effluent zone from the debris channels, said flow of fluid having effectiveness in scouring the hole being drilled, whereby a significant portion of the cutting edges act upon surfaces previously scoured to substantially debris free condition, the fluid from said ports effectively cooling the cutting edges of the cutting members by reason of the controlled directional flow of the fluid, and whereby the debris-containing fluid is directed through the debris channels by relatively low resistance pressure routes toward the effluent zone and whereby the debris does not clog the zone adjacent a channel sidewall helping to form a knife-like cutting edge and whereby troublesome deposits of debris do not accumulate on a connecting surface of a debris channel and whereby significant scouring power and fluid pressure can be applied without troublesome uplifting propensities upon the rotating bit.

3,871,489
METHOD OF WEIGHING SOLID MATERIAL WETTED BY A NON-REACTIVE LIQUID

Edward N. Patigalia, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 21, 1974, Ser. No. 453,479
Int. Cl. G01g *5/02*; **G01n** *9/02*
U.S. Cl. 177—1 **6 Claims**



1. A method of accurately determining the dry weight or dry density of a quantity of a solid material of known dry density or dry weight, respectively, wet by a film of a non-reactive liquid of known density, comprising the following steps:

filling a cup-shaped vessel, having an overflow means which determines a constant maximum volume, with the same kind of liquid to the level determined by said overflow means;

weighing the vessel with its liquid filling;

placing said solid material with its liquid film in said liquid-filled vessel, thereby displacing part of the liquid from the vessel;

weighing the vessel with the solid material and the remaining liquid; and

calculating the dry weight S or the dry density D_S of the solid material, using the known dry density or dry weight, respectively, of the solid material, the known density D_L of the liquid, the two measured weights, and the formula

$$S = D_S(B - A/D_S - D_L)$$

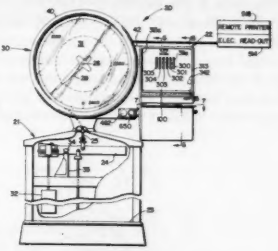
where B is the measured weight of the vessel filled with solid and liquid, and A is the measured weight of the vessel filled with liquid alone.

3,871,490
WEIGHING AND PRINTING APPARATUS

Austin L. Davis, Brandon, and Harley R. Davidson, Rutland, both of Vt.

Division of Ser. No. 309,879, Nov. 27, 1972,. This application Feb. 27, 1974, Ser. No. 446,404
Int. Cl. G01g *23/38*
U.S. Cl. 177—10 **10 Claims**

1. In an apparatus for weighing a load and for printing the weight of the weighed load, a scale mechanism for weighing the load, a printer having a plurality of rotatably mounted carriers, a lock member mounted for displacement between a locking position where it directly engages said carriers to lock said carriers against rotation and an unlocking position where it releases said carriers to allow rotation thereof, a rotatably mounted shaft forming a part of said scale mechanism, means forming a part of said scale mechanism for rotating said shaft through an angular distance that is proportional to the weight of the load being weighed, cam means mounted on said shaft, means operatively connected to said carriers and including elements that are cooperatively engageable with said cam means for rotating said carriers to positions for printing the weight of the weighed load, and selectively operated means for sequentially engaging said elements with said cam means to rotate said carriers to positions for printing the weight of the weighed load and for displacing said lock member to its locking position to lock said carriers in the positions to which

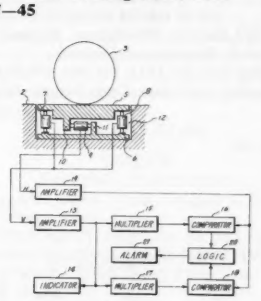


said carriers have been rotated to print the weight of the weighed load.

3,871,491
AXLE LOAD METER

Masami Yamanaka, Miki, and Yasutoshi Masuda, Ashiya, both of Japan, assignors to Yamato Scale Company, Limited, Akashi-shi, Hyogo-ken, Japan

Filed May 28, 1974, Ser. No. 473,361
Claims priority, application Japan, Dec. 13, 1973, 48-140163
Int. Cl. G01g *23/18, 19/02*
U.S. Cl. 177—45 **1 Claim**



1. An axle load meter, comprising a measuring platform on which a vehicle to be weighed runs, means for detecting a vertical load applied to said platform to produce a first output representing said vertical load, means for detecting a horizontal force applied to said platform to produce a second output representing said horizontal force, means for calculating a ratio of said vertical load and said horizontal force from said first and second outputs, means for producing an alarm when said ratio is not within a predetermined range, and means of indicating said vertical load based upon said first output.

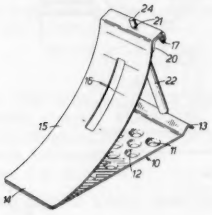
3,871,492
VEHICLE CHOCK

Kenneth John Garrett, Chesham, and Ronald Denis Fox, Amersham, both of England, assignors to Humphrey Thompson Enterprises Limited, Middlesex, England

Filed Mar. 14, 1973, Ser. No. 341,090
Claims priority, application Great Britain, Mar. 15, 1972, 12096/72
Int. Cl. B60t *3/00*
U.S. Cl. 188—32 **8 Claims**

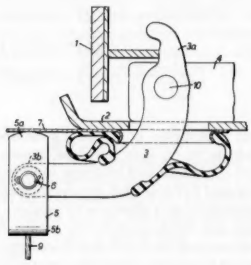
1. A chock for a vehicle wheel comprising, in combination:
a. a first substantially rigid plate engageable with a roadway;
b. a second flexible plate overlying the first plate;

c. first and second ends to each of said plates;
d. means securing said plates together at said first ends;
e. an inverted V-section channel extending transversely of said first plate at the second end thereof;
f. means defining an aperture in said inverted V section channel;



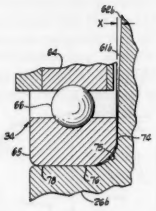
g. a removable pin of a size to pass through the aperture in said inverted V section;
h. a shoulder formed in said pin near the upper end thereof to define a neck portion;
i. means defining an aperture in said second end of said second plate to receive said neck portion.

3,871,493
SHOE DRUM BRAKES
Christopher Neil Mathias, Birmingham, England, assignor to Girling Limited, Birmingham, England
Filed Oct. 26, 1973, Ser. No. 409,808
Claims priority, application Great Britain, Dec. 21, 1972, 59284/72
Int. Cl. F16d *51/00*
U.S. Cl. 188—78 **6 Claims**



1. In an internal shoe drum brake for a vehicle wheel, comprising a fixed member, a rotatable brake drum, a pair of arcuate brake shoes mounted on the fixed member and having friction linings for engagement with the brake drum, a mechanical actuator comprising an angularly movable lever being pivotable about a point intermediate its ends between a brake applied position and a retracted position wherein the brakes are released and having one end pivotally connected to one of said shoes, and brake applying means pivotally connected to the other end of said lever, the improvement comprising a stop member forming a releasable pivotal connection between said lever and said brake applying means, and an abutment member engaged by said stop member to hold said lever in a first retracted position spaced from a second position of greater retraction.

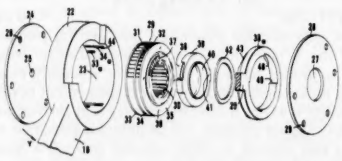
3,871,494
LIFT TRUCK MAST
Wilfred H. Kelly, Jr., Rt. 1, P.O. Box 295A, Maple Plain, Minn. 55359
Division of Ser. No. 55,064, July 15, 1970,. This application Apr. 12, 1973, Ser. No. 350,621
Int. Cl. B66b *7/02*
U.S. Cl. 187—95 **25 Claims**



1. A structural member for use in a multi-sectional mast having a stationary and extensible section, one being laterally offset relative to the other and each extending longitudinally parallel to the axis of the mast and said extensible section being longitudinally parallel to the axis of the mast and said extensible section being longitudinally slidable relative to the stationary section forming therewith longitudinally extending trackways, and anti-friction rollers carried on at least one of said sections adapted to roll in said trackways when extending or retracting one section relative to the other, said structural member being adapted to form a portion of said trackways and comprising,

a web portion for defining a longitudinally extending side of said trackways and having a surface inclined to the rollers in said trackways diverging, in cross section, on a line from a point of tangency with said rollers and joining a straight surface at an angle of between 1° and 20° relative thereto, said straight surface extending perpendicularly to the axis of said rollers and said inclined surface and straight surface being laterally spaced from and out of contact with said rollers except at said point of tangency on the inclined surface thereby minimizing any tendency for axial loading of said rollers.

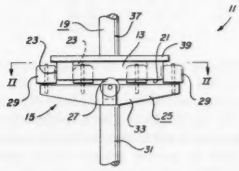
3,871,495
AUTOMATIC SLACK ADJUSTER FOR AIR BRAKES
Lloyd Raymond Devitt, 242 Oakdale Ave., Apt. 103, Saint Catharines, Ontario, Canada
Filed Oct. 24, 1973, Ser. No. 409,262
Int. Cl. F16d *65/56*
U.S. Cl. 188—79.5 K **4 Claims**



1. A slack adjuster mountable on the brake actuating spline shaft of an automotive brake of the brake issue type and comprising a slack adjuster housing in the form of a body ring having an actuator arm extending rigidly therefrom for connection to a brake rod, said body drive ring having a large central through bore extending between cover plates, one of said cover plates having a central bore adapted slidably to accommodate said actuator shaft therethrough; a driven ring

within said body ring, said driven ring having a splined bore meshing with the spline of said actuator shaft and slidable therealong, said driven ring having drive and reverse ratchet means of similar predetermined ratchet step angle thereon; pawl means within said body ring meshing with the ratchet means of said driven ring for transmission of torque from said body ring to said driven ring; a slack ring rotatable within said body ring through a predetermined angle; an anchor arm extending from said slack ring exteriorly of said body ring for connection to a rigid anchorage; an adjuster ring freely rotatable about said actuator shaft and rotatable within said slack ring through a predetermined angle; ratchet means on said adjuster ring meshing with the ratchet means of said driven ring; and a compression spring urging the ratchet means of said adjuster ring and said driven ring into meshing relationship.

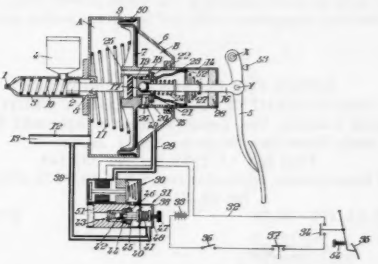
3,871,496
RATE CONTROLLING DEVICE
Voorhis F. Wigal, P.O. Box 1542, Jackson, Tenn. 38301
Filed Mar. 2, 1973, Ser. No. 337,730
Int. Cl. F16f *9/30*
U.S. Cl. 188—268 **3 Claims**



2. A device attached to a moving element for controlling the rate of motion of the moving element, said device comprising: a flexible envelope, said flexible envelope being annular and being positioned on the same axis as the moving element; roller means responsive to the moving element for applying force against said flexible envelope, said roller for applying force against said flexible envelope, said roller means including at least one primary roller for forcefully contacting the face of said flexible envelope causing the face of said flexible envelope to be flattened, said primary roller having its axis perpendicular to the axis of said flexible envelope, said roller means including at least one auxiliary roller for contacting at least one side of said flexible envelope aiding said flexible envelope to return to its original shape after being flattened by said primary roller, said auxiliary roller having its axis parallel to the axis of said flexible envelope; and a non-Newtonian, thixotropic liquid enclosed within said flexible envelope which firmly resists suddenly applied force but not slowly applied force.

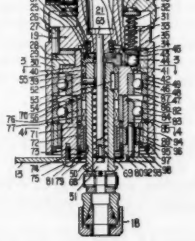
3,871,497
VEHICLE BRAKE INSTALLATIONS
Pierre Etienne Bessiere, Golf-St-Nom-La-Breteche, France, assignor to Labavia - S.G.E., Paris, France
Filed Mar. 5, 1973, Ser. No. 337,822
Claims priority, application France, Mar. 10, 1972, 72.08452
Int. Cl. B60k *29/02*
U.S. Cl. 192—3 TR **12 Claims**

1. Brake installation for a vehicle with an internal combustion engine, comprising brakes actuated by the movements of a piston member in a master cylinder, which movements themselves are controllable by thrust on a brake pedal connected to said piston member by an assistance mechanism of the vacuum "servobrake" type, said mechanism comprising: a fixed casing divided into two compartments A and B by piston means connected to said piston member, pipe means for applying in said compartment A, furthest spaced from the brake pedal, the suction which exists at a suitable point of said engine, first valve means controlled by the brake pedal, first passage means connecting compartment A to said first valve means, second passage means connecting said first valve means to compartment B, third passage means connecting said first valve means to the atmosphere, said first valve means transmitting the same suction in compartment A to compartment B as long as said pedal is released and reducing this sucction automatically when the pedal is relatively depressed,



by connecting said compartment B with the atmosphere through said third passage means, said installation including: duct means leading from compartment B to the atmosphere, second valve means comprising a simple stop valve inserted in said duct means and control means other than said brake pedal arranged to regulate the action of said stop valve and including assistance mechanism comprising a further valve mounted on said second passage means, which further valve is adapted to be tranversed by a relatively high air-flow towards compartment B and by a relatively low air-flow towards compartment A.

3,871,498
TAPPING ATTACHMENT
Ryoichi Kitaguchi, Osaka, Japan, assignor to Daishowa Seiki Co., Ltd., Osaka, Japan
Filed July 27, 1973, Ser. No. 383,393
Claims priority, application Japan, July 31, 1972, 47-90712
Int. Cl. F16d *21/04;* **F16h** *5/10*
U.S. Cl. 192—48.91 **3 Claims**



1. A tapping attachment comprising, in combination, a housing (**19**) including a central portion, means for transmitting normal torque from a first rotating member (**11**) to a second rotating member (**16, 50, 52**) by the intermediary of first clutch means (**40** to **42, 44**), a clutch sleeve (**39**) rotatable by means of said first clutch, a direct-drive clutch (**57**) received by said sleeve and axially movable spring means (**67**) of which one end is received in a portion (**66**) of said housing while the other end engages a portion (**62**) of said clutch, at

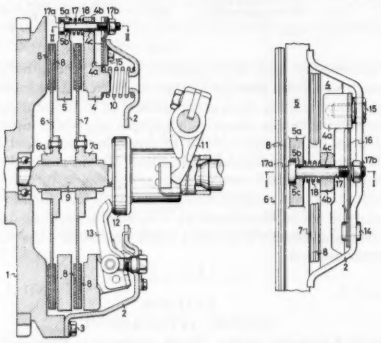
least one axially projecting first portion (61) on said direct-drive clutch, at least one projecting second portion (55) on said second rotating member, which second portion engages said first projecting portion by the action of second spring means (69) disposed about a spindle (63) mounted axially in said central portion of the housing, a reverse-drive clutch (71) having at least one projecting third portion (78) which engages at least one oppositely projecting fourth portion (56) of said second rotating member by the axial movement of said housing, and third spring means (74) for slight axial movement of said reverse-drive clutch and for resiliently pressing the same to avoid chattering when said reverse-drive clutch comes into engagement with said fourth projecting portion.

3,871,499

DEVICE FOR PREVENTING IMPROPER DISENGAGEMENT OF MULTIPLE-DISC CLUTCH

Adachi Kazuma, Yao, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Osaka, Japan

Filed Feb. 13, 1973, Ser. No. 332,145
Claims priority, application Japan, Feb. 14, 1972, 47-15398
Int. Cl. F16d *13/69*
U.S. Cl. 192—70.29 **8 Claims**



1. A multiple-disc clutch comprising a plurality of clutch discs having friction facings between a flywheel and a pressure plate, an intermediate plate interposed between the friction facings of the clutch discs and rotatable with the flywheel and the pressure plate, a plate spring having one end secured to a clutch cover connected to the flywheel and the other end secured to the pressure plate and a guide member having one end in engagement with an intermediate portion of the length of the plate spring and the other end in engagement with the intermediate plate, the guide member forcing the intermediate plate to follow the movement of the pressure plate for movement at a definite ratio relative to the movement of the pressure plate when the clutch is operated for disengagement.

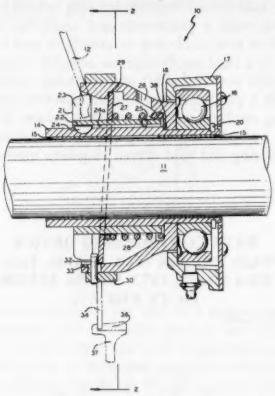
3,871,500

SELF-ADJUSTING RELEASE MECHANISM FOR FRICTION CLUTCHES

Donald F. Linn, Manlius, and George L. Wishart, N. Syracuse, both of N.Y., assignors to Lipe-Rollway Corporation, Syracuse, N.Y.

Filed Jan. 14, 1974, Ser. No. 433,248
Int. Cl. F16d *13/75*
U.S. Cl. 192—111 A **4 Claims**

1. In a friction clutch for connecting driving and driven shafts, the clutch having means for normally effecting a driving connection between the shafts and release levers actuatable to disengage said driving connection, the improvement comprising an inner sleeve member axially slidable on the driven shaft, an outer sleeve member axially slidable on the inner sleeve member, means on one of the sleeve members engageable with the release levers for actuating same, an annular member dimensioned to loosely fit about the outer sleeve member, means operably connecting a point on the annular member with the inner sleeve, means acting on the annular member so that it is moved from the perpendicular and frictionally grips the outer sleeve member, whereby axial movement of the one sleeve member in one direction operates



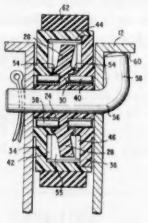
to correspondingly move the other sleeve member and actuate the release levers, and means to force the annular member towards the perpendicular and thereby release the grip of said member on the outer sleeve, such release means being operable when the wear on the clutch driving connection reaches a particular point to permit relative axial movement between the sleeve members to compensate for the wear.

3,871,501

SILICONE PUTTY RETARDER

Andrew T. Kornylak, 400 Heaton St., Hamilton, Ohio 45011

Continuation-in-part of Ser. No. 176,741, Aug. 31, 1971, abandoned, which is a division of Ser. No. 850,835, Aug. 18, 1969, abandoned. This application Sept. 26, 1973, Ser. No. 400,910
Int. Cl. B65g *13/00*
U.S. Cl. 193—35 A **6 Claims**



1. A conveyor comprising a pair of laterally spaced rails and a series of rollers extending between said rails for supporting a load,

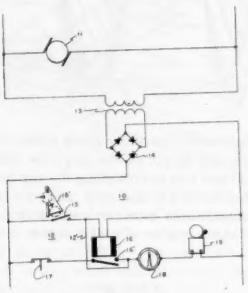
at least some of said rollers being retarder rollers each of which comprises,

a stator fixed to the rails,

a rotor surrounding the stator and forming an enclosed housing having walls, silicone putty in the housing, and means on the rotor and stator for deforming the material, comprising vanes on the stator and means on all the walls of the housing for holding the putty for rotation therewith, the vanes on the stator comprising members extending radially into the putty, each having a wedge shaped portion presenting a sharp edge opposite to the direction of rotation of the rotor and putty, the edges of consecu-

tive banes being on opposite sides of a common plane normal to the rotor axis.

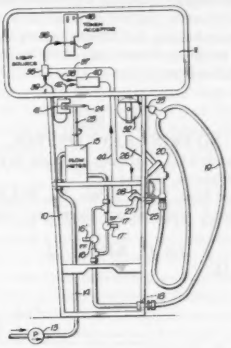
3,871,502
COIN-OPERATED CLOCK ALARM
Robert E. Critchfield, Rt. 6, Box 6727, Nampa, Idaho 83651
Filed Feb. 28, 1974, Ser. No. 446,867
Int. Cl. G07f *5/10*
U.S. Cl. 194—9 T **1 Claim**



1. A coin-operated clock comprising:
a synchronous electric motor connected to a remote source of power; and
a control subcircuit being connected to said remote source of power through a transformer and a full-wave rectifier, said control subcircuit having connected in parallel a first series circuit including a coin-operated switch and a relay which has an electrically actuated contactor, a second series circuit including a reverse push button alarm shut-off switch, a timer switch in communication with said clock motor, and an alarm, the contactor of said relay being connected between said alarm shut-off and said timer switch and being inter-connected between the contactor terminal and said coin-operated switch and the coil connection of said relay to be operable, when a coin is present to activate said relay, to connect said timer, said alarm shut-off switch, and said alarm to allow setting.

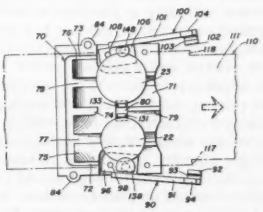
3,871,503
GASOLINE DISPENSER
Robert C. Greenwood, Cypress, Calif., assignor to Pan-Nova, Inc., Santa Fe Springs, Calif.
Filed Dec. 26, 1973, Ser. No. 427,579
Int. Cl. G07f *15/00*
U.S. Cl. 194—13 **4 Claims**

1. In a fluid dispensing system, the combination of:
a first compartment having therein a fluid inlet line, flow control valve means, a flow meter with output shaft, and a fluid outlet line with nozzle interconnected for fluid flow from the inlet to the outlet line;
a second compartment having electrical computation, control and display units therein;
means for isolating said second compartment from said first compartment;
a light source in said second compartment;
light detector means in said second compartment;
a disk having spaced opaque segments thereon and mounted on said flow meter shaft for rotation;
first fiber optic means defining a first light path through said second compartment from said source to said detector means and including means positioning said disk at said first path for opening and closing said first path as said flow meter shaft rotates;
a receptacle for said nozzle having a movable member actuated by inserting and removing the nozzle; and
second fiber optic means defining a second light path through said second compartment from said source to said detector means and including means positioning said



member at said second path for opening and closing said second path;
said light detector means including means for producing electrical signals corresponding to light path openings or closings.

3,871,504
COIN CHUTE WITH IMPROVED CALIPERING AND LATCHING MECHANISM
Mario Anesi, Inverness; Salvatore Macri, Chicago, both of Ill., and John P. Wynn, Macon, Ga., assignors to Ansan Tool and Manufacturing Co., Inc., Chicago, Ill.
Filed June 4, 1973, Ser. No. 366,583
Int. Cl. G07f *1/06*
U.S. Cl. 194—55 **25 Claims**



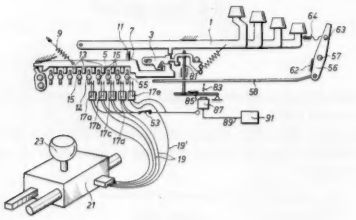
1. A coin chute comprising a housing being substantially rectangular in plan and having a pair of sides, at least one of said sides having an outwardly facing elongated recess therein extending in the direction of said one side, a lever including an elongated arm and an abutment on said arm adjacent to one end thereof and a mounting portion on said arm adjacent to the other end thereof, means pivotally mounting said mounting portion to said housing to enable said arm to swing into and out of said recess, said abutment being movable with said arm between a latching position when said arm is in said recess and an unlatching position when said arm is out of said recess, means attached to said housing and to said lever for urging said abutment to the latching position thereof, a slide reciprocably carried by said housing between said sides thereof and reciprocable between a retracted position and a fully advanced position and having a coin-receiving aperture therein, a keeper on said slide engageable with said abutment in the latching position thereof when said slide is advanced to

a position short of full advancement for latching said slide against further advancement, and first and second laterally aligned elements respectively mounted on said housing and on said lever and arranged to receive therebetween a coin carried by said slide, said elements having an initial spacing therebetween corresponding to a coin of a predetermined denomination, so that such coin carried by said slide will move said second element and cause said lever to carry said abutment to the unlatching position thereof and thereby free said slide to move toward full advancement.

3,871,505
NO-PRINT KEY CONTROL

Rolf Theilen, Sande i.O., Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed Sept. 7, 1973, Ser. No. 395,259
Claims priority, application Germany, Oct. 13, 1972, 2250269
Int. Cl. B41j *23/02*
U.S. Cl. 197—16 **4 Claims**



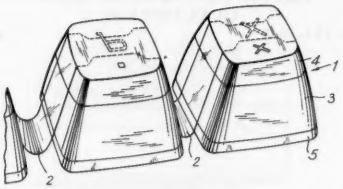
1. In a typewriter having a keyboard with a plurality of key means corresponding to the characters to be printed and a plurality of key means corresponding to no-print functions such as spacing and back spacing, and a power driven printer which is controlled by the key means, the printer including a single type carrier with a plurality of characters which is moved with respect to a record carrier for printing, a character setting means, including a plurality of electromagnets which are selectively actuated in response to a selected character key means, for positioning the single type carrier to the character to be printed, and a printing means, including an electromagnet, which is responsive to the selected key means for causing the printing movement of said single type carrier to print the selected character, the improvement comprising a special no-print key means on said keyboard; and control means, including a plurality of electrical switches connected in the current paths of said electromagnets and responsive to the selection of said special no-print key means, for interrupting the flow of current to said electromagnets for preventing the operation of said setting means and of said printing means, said control means being responsive to the selection of one of said no-print function key means for interrupting the flow of current to said electromagnet of said printing means for preventing the operation of said printing means.

3,871,506
EXCHANGEABLE KEYBOARD FOR BALL TYPEWRITERS

Kirill von Luders, Pohjolankatu 43 A 3, 00610 Helsinki 61, Finland

Filed Aug. 8, 1973, Ser. No. 386,742
Int. Cl. B41j *5/08*
U.S. Cl. 197—98 **4 Claims**

1. In an exchangeable keyboard least one ball typewriters, adapted for use upon the type ball of the typewriter being exchanged for another ball having indicia or characters thereon which differ from that of the first-mentioned ball, said keyboard including a plurality of caps adapted to be superimposed on respective of the typewriter keys, and at leastone durable elastic strip extending between adjacent ones of said caps so as to interconnect the latter into a single entity; the improvement comprising said caps each including a cap body portion, and a cover portion mounted on said body portion,

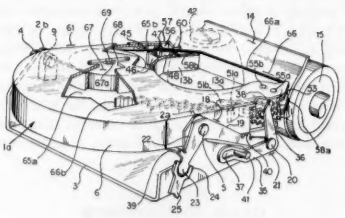


said strip continuously extending along each row of keys for substantially the full length of the key row, said strip being fastened to each said cap intermediate the cap body and cover portions, notches formed in said strip, said strip being engaged in a form-fit attachment between each said cap body and cover portions in the region of said notches.

3,871,507
SPOOLLESS RIBBON CARTRIDGE WITH LIFT AND FEED FEATURES COMBINED

Donald S. Perry, 858 Renetta Ct., Los Altos, Calif. 94022; Wyland L. Fowler, R.D. 2, Box 626, Green, N.Y. 13778; Richard E. Shattuck, 3869 Highland Rd., and Hans W. Mueller, 14 Louise Dr., both of Cortland, N.Y. 13045

Filed June 5, 1972, Ser. No. 259,766
Int. Cl. B41j *33/14*
U.S. Cl. 197—151 **12 Claims**



1. A spoolless ribbon cartridge for printing machines with at least one print element, comprising

a. a housing having a first chamber with an entrance opening and a second chamber with an exit opening,

b. a roll of carbon ribbon preloaded in said second chamber, said carbon ribbon having an active portion and an inactive portion and said inactive portion being storable in said first chamber,

c. a pair of projecting members associated with said housing and operable to support said active portion of said carbon ribbon in a spanning relationship with respect to said projecting members and external to said first and second chambers in a position accessible for cooperation between said print element and said carbon ribbon, and

d. means for feeding said carbon ribbon mounted in said housing proximate said entrance opening and in direct-contact driving relationship with said carbon ribbon whereby said carbon ribbon may be drawn through said exit opening, over said projecting members and into said entrance opening for forced, random storage of said inactive portion in said first chamber.

3,871,508

TABULAR DEVICE FOR AN OFFICE MACHINE

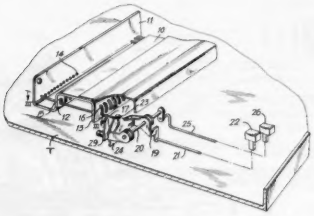
Leif Gunnar Petersson, Svangsta, Sweden, assignor to Facit-Halda Aktiebolag, Svangsta, Sweden

Filed Oct. 1, 1973, Ser. No. 402,154

Claims priority, application Sweden, Mar. 21, 1973, 7303960

Int. Cl. B41j *21/02, 21/04*

U.S. Cl. 197—176 7 Claims



1. A tabulator mechanism for an office machine having stop members comprising a tabulator rack provided with a plurality of tabulating stops co-acting with said stop members, said tabulator rack having three spaced structural elements, each being provided with a set of spaced holes extending in separate spaced planes parallel to the longitudinal axis of said tabulator rack, the spacing between each adjacent hole in each set corresponding to one step of travel of the machine, each of the holes in said middle set being offset relative to the corresponding holes in both the interior and exterior structural elements, said tabulating stops being yieldable pins and each being inserted through one hole in each of the three corresponding rows of holes so that the tabulating stop will be under tension in the direction of the longitudinal axis of said tabulator rack, each hole of the exterior set of spaced holes being elongated and arcuate whereby an end of each of the tabulating stop assumes a stable position in a selected end of said elongated and arcuate hole.

3,871,509

DEVICE FOR CONTROLLING THE WORKING SPEED OF BOTTLE TREATING MACHINES, PREFERABLY FILLING MACHINES IN BOTTLE TREATING INSTALLATIONS

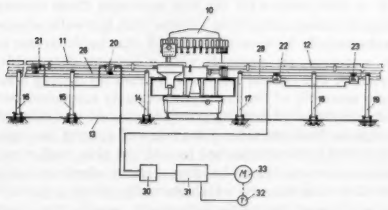
Jurgen Kuster, Bad Munster-Ebernburg, and Hermann Schlosser, Kamp-Bornhofen, both of Germany, assignors to Seitz-Werke GmbH, Bad Kreuznach, Germany

Filed July 5, 1973, Ser. No. 376,609

Claims priority, application Germany, July 10, 1972, 2233791

Int. Cl. B65g *43/08*

U.S. Cl. 198—37 8 Claims



1. In a bottle filling machine; a bottle filling station, conveyor means for conveying bottles to and from said station, drive motor means operatively associated connected to said conveyor means and operable to cause bottles to move therealong at a speed conforming to the speed of the motor means, a signal operated speed controller connected to said motor means operable in response to the supply of signals thereto to adjust the speed of said motor means, support means for said conveyor means engaging points therealong spaced in the conveying direction, said conveyor means being vertically resilient between said points of engagement thereof so as to be yieldable under the weight of the bottles thereon, and detector means responsive to vertical movement of said conveyor means between said points for supplying control signals to said speed controller, said conveying means comprising an incoming conveyor for conveying bottles to said filling station and an outgoing conveyor for conveying bottles from said filling station, said support means comprising a plurality of supports for each conveyor engaging a plurality of points along the respective conveyor and spaced in conveying direction, each conveyor being vertically resilient between the said points of support pertaining thereto so as to be vertically yieldable under the weight of bottles therein, said detector means comprising at least one detector for each conveyor disposed along the respective conveyor between a pair of the said supports therefor, a control device connected between said detectors and said speed controller operable to receive signals from said detectors and to supply signals to said speed controller, said control device being operable to cause the speed of said motor means to reduce in response to vertical downward movement of said outgoing conveyor regardless of the vertically deflected condition of said incoming conveyor, and a pair of interconnected detectors for each conveyor, each detector being disposed between the supports of a respective pair thereof for the respective conveyor.

3,871,510

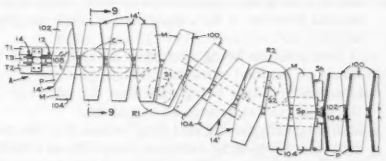
MAGNETIC CONVEYOR STRUCTURE

Ronald F. Homeier, Plainfield, Ind., assignor to FMC Corporation, San Jose, Calif.

Filed Apr. 19, 1973, Ser. No. 352,834

Int. Cl. B65g *17/46*

U.S. Cl. 198—41 3 Claims

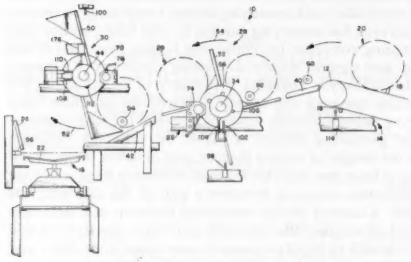


1. A chain conveyor of the type having a flexible chain of articulated segments for curving movement in horizontal and vertical planes and having a plurality of platforms connected, respectively, to said segments, said conveyor having means to guide said flexible chain along a path, said platforms each having a surface to receive metallic articles to be conveyed, each of said surfaces lying in a plane extending in the direction of movement of the segment to which the platform is connected, the improvement comprising a flexible magnet having a substantially planar surface mounted on each of said platforms to attract said metallic articles for conveyance along the path of said chain.

3,871,511
SORTER SYSTEM INDUCTION MEANS

Edward A. Wentz, Gaithersburg, and David M. Shinnick, Frederick, both of Md., assignors to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Feb. 9, 1973, Ser. No. 331,205
Int. Cl. B65g 37/00
U.S. Cl. 198—103 10 Claims

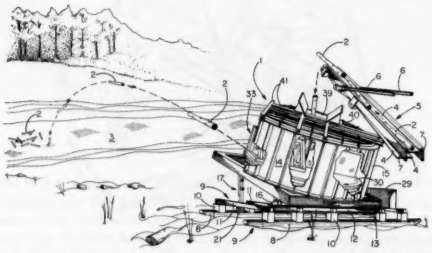


1. The combination comprising
an input conveyor,
a sorter conveyor having means along the path thereof for discharging articles from the conveyor to predetermined zones along the path of the conveyor,
and means for transferring articles from the input conveyor to the sorter conveyor comprising
first rotor means having four vanes defining article receiving pockets,
means for rotatably mounting said first rotor means between said input conveyor and said sorter conveyor about a generally horizontal axis parallel to a portion of the path of the sorter conveyor,
drive means operatively connected to said rotor means for intermittently rotating said first rotor means in one direction for bringing a pocket successively from a first to a second position, a third position and then the first position,
said first position being such that a vane of each pocket forms an inclined entrance ramp,
said second position being such that the adjacent vane of the same pocket defines an exit ramp,
said drive means driving said rotor means at a rate such that said vane forming an entrance ramp lifts an article being transferred from said first position to said second position and augments the gravitational movement of the article to said second position such that the article moves off of the vane that is acting as an exit ramp,
an inclined receiving ramp onto which the article is delivered at the second position,
gate motor means,
means for rotatably mounting said gate rotor means between said receiving ramp and said sorter conveyor about a generally horizontal axis parallel to a portion of said sorter conveyor and parallel to the axis of said rotor means,
drive means operatively connected to said gate rotor means for intermittently rotating said gate rotor means 180°,
said gate rotor means having two diametrically opposed vanes which successively cooperate with said receiving ramp to define a receiving pocket for an article transferred from said first rotor means.

3,871,512
PULPWOOD EJECTOR

David L. Davidson, Kapuskasing, and Donald K. Romanowich, Virgil, both of Ontario, Canada, assignors to Spruce Falls Power and Paper Company Limited

Filed Mar. 12, 1973, Ser. No. 340,180
Int. Cl. B65g 31/00
U.S. Cl. 198—128 1 Claim

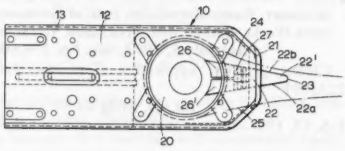


1. A method of transporting pulpwood logs from one location to another which comprises feeding pulpwood logs in sequence to a rotating wheel on which the logs may move about to become oriented in a desired direction, confining logs on the wheel circumferentially while raising the log speed as the logs orient, moving the logs in the rotation of the wheel to a zone of non-confinement circumferentially so that the oriented logs eject from the wheel.

3,871,513
DRIVE STATIONS

Werner Georg; Heinrich Cwielong, and Wilfried Mertens, all of Altlunen, Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed July 14, 1972, Ser. No. 271,948
Claims priority, application Germany, July 14, 1971, 2135163
Int. Cl. B65g 23/00
U.S. Cl. 198—203 4 Claims

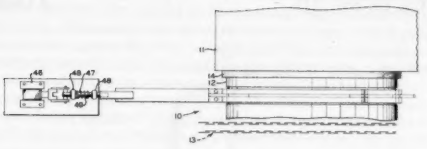


1. A drive station for use with a scraper chain conveyor in mineral mining comprising a frame with sidewalls adjoined by a substantially horizontal floor wall attachable to one end of the conveyor; an assembly with a housing detachable supported by one of said sidewalls; a drum for driving a scraper chain assembly of the conveyor rotatably supported between said sidewalls in a bearing provided on said one sidewall and accessible from the side of the sidewall nearest the assembly; a detachable cover attached to said one side- wall removable to permit access to said bearing; a chain wheel rotatably supported by said housing which normally adopts a position facing said cover; means for selectively moving the housing in either a direction transverse to or parallel to the longitudinal axis of the conveyor to permit the housing to adopt a position where the cover is accessible; and means for guiding the housing for movement in relation to said sidewall.

3,871,514
SAFETY BRAKE APPARATUS FOR BELT CONVEYOR

John H. Hewitt, Suffield, and Ernest D. Johnson, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 5, 1973, Ser. No. 376,423
Int. Cl. B65g *43/00*
U.S. Cl. 198—232 12 Claims

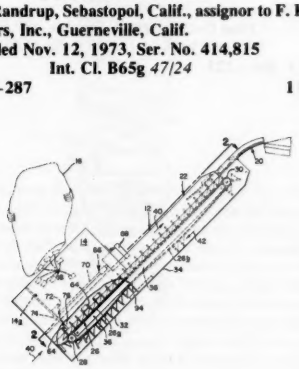


1. A safety brake apparatus for stopping a conveyor belt upon a drive chain failure, comprising:
- a conveyor belt,
- at least one drum engaging said conveyor belt;
- said drum having an exterior extension located outwardly of said belt;
- said exterior extension having a radially outward braking surface;
- a ratchet assembly mounted about said exterior extension braking surface;
- a brake member attached to the radial inner surface of said ratchet assembly and contacting said exterior extension braking surface with a selective frictional force;
- a pawl bar mounted juxtaposition to said ratchet; and
- a means for detecting a failure in the drive chain and activating said pawl to contact and stop said ratchet assembly so that said brake member applies a selective frictional force to said exterior extension braking surface to stop said drum, and also to cause said drive chain and said conveyor belt to stop in a relative short period of time.

3,871,515
CONVEYOR DEVICE

Benjamin F. Randrup, Sebastopol, Calif., assignor to F. Korbel and Brothers, Inc., Guerneville, Calif.

Filed Nov. 12, 1973, Ser. No. 414,815
Int. Cl. B65g *47/24*
U.S. Cl. 198—287 1 Claim

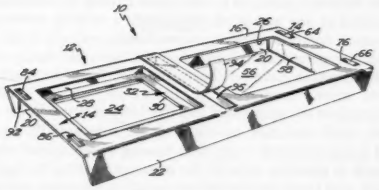


1. A conveyor assembly to individually engage and carry work pieces of the type having an identifiable longitudinal shape, such as corks for bottles and the like, in end-to-end alignment in the direction of movement from a source station to a discharge station, wherein said pieces at said source station are randomly disposed therein, said assembly comprising:
- a trough having a longitudinal recess therealong and means mounting said trough so as to position one end of said recess proximate said source station and the other end at said discharge station;
- chain means mounted beneath said trough to provide a continous and movable stretch of chain immediately adjacent to and along said longitudinal recess from said source station to a terminus proximate said discharge station;
- engaging means secured to said stretch of chain and extending through said longitudinal recess to engage said work pieces and transport the latter along the longitudinal recess of said trough;
- at least two deflecting means secured to each side of said trough proximate the longitudinal recess thereof to deflect a work piece carried by said engaging means in other than end-to-end alignment in the direction of movement of said stretch of chain, thereby to realign the work piece in end-to-end alignment or dislodge the work piece from said engaging means and prevent delivery of the misaligned piece, said deflecting means comprising a pair of flanges at right angles to each other wherein the profile of the flat surfaces defines a pair of right triangles having one side and an apex in common and secured to the side of the trough with one flange with the apex facing the source station and with the tapered edge of the other flange positioned to contact work pieces that are not in end-to-end alignment;
- further final alignment means located on the sides of said trough proximate the input end of said means to receive each of said work pieces to urge the latter into said end-to-end alignment;
- means including a conduit shaped to receive each of said work pieces in end-to-end alignment upon arrival at said discharge station and securing said conduit in alignment with said longitudinal recess, and remove said pieces in such alignment and cause delivery thereof to a subsequent work station;
- means secured to said conduit at the end thereof wherein said work pieces enter, said means adapted to impinge on a work piece transported therealong when such work piece is misaligned in a vertical direction in respect to end-to-end alignment; and
- driving means to cause said stretch of chain to be continuously moved from said source station to said discharge station, and back again.

3,871,516
ANTITHEFT PACKAGING DEVICE

Howard P. Holkestad, Minnetonka, and Raymond G. Ordner, Minneapolis, both of Minn., assignors to J. L. Marsh Incorporated, Minneapolis, Minn.

Filed June 11, 1973, Ser. No. 368,650
Int. Cl. B65d *85/672*, *25/10*, *25/54*
U.S. Cl. 206—45.31 27 Claims



1. Antitheft device for packaging small articles, comprising in combination: an article to be packaged, the article being of fixed dimensions; a hollow, vertically elongated body, including a generally closed front face, the body being divided into a top portion and a bottom portion, with viewing apertures defined in the top and bottom portions of the front face to allow the article to be packaged within the hollow body to be visible and viewed through the front face of the top and bottom portions of the body, the viewing apertures being of a dimension less than the fixed dimensions of the article to be

packaged to prevent passage of the article within the hollow of the body through the viewing apertures, the body further including a hinge member and including a latch member separated from the hinge member by at least a dimension of the article to be packaged; and a retainer member of a dimension to cover at least a part of the top portion or at least a part of the bottom portion of the body including a hinge member and including a latch member separated from the hinge member by a distance arranged to removably cooperate with the body hinge member and body latch member to secure the article to be packaged between the body and the retainer member and yet allow viewing of the article through the viewing aperture and allow removal of the retainer member to remove the article from the body upon sale of the article while retarding theft of the article before sale.

3,871,517

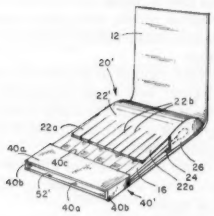
SAFETY BOOK MATCH COVER

William F. Cioffi, 1817 E. 12th St., Brooklyn, N.Y. 11229

Filed Aug. 3, 1972, Ser. No. 277,673

Int. Cl. A24f *27/12*

U.S. Cl. 206—108 **9 Claims**



1. In a match book having a plurality of removable matches each having an ignitable head and connected to a back panel having a predetermined width, the match book further having a foldably connected front panel movable relative to the back panel between positions to cover and expose the matches and provided at one end of the book with a striking surface, the invention comprising cover means connected only to the back panel for permanently enclosing the ignitable heads of the matches which have not been removed from the book, said cover means comprising a substantially closed container mounted on the back panel and fixed in position relative to the latter, said container having a length substantially equal to said predetermined width and having an elongated slot arranged to pass the ends of the matches bearing the ignitable heads, said cover means further including a portion positioned on the other side of the matches from the back panel which extends along and substantially covers the matches, said portion being provided with a plurality of parallel slits extending from the free edge of the portion toward the match heads to provide a plurality of sections having widths approximately equal to the widths of the matches with each section in overlying registration with a match, whereby only one of said sections must be bent during removal of a match positioned below a respective section, and whereby said container always encloses the ignitable heads to the same extent independently of the position of the front panel relative to the back panel.

3,871,518

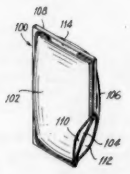
HYGIENIC DOUCHE SYSTEM

Jerome L. Murray, 652 First Ave., New York, N.Y. 10016, and Frances R. Gardiner, 43 Park Rd., Sparta, N.J. 07871

Division of Ser. No. 231,336, March 2, 1972, Pat. No. 3,756,236, which is a continuation-in-part of Ser. No. 197,848, Nov. 11, 1971, Pat. No. 3,756,230. This application July 26, 1973, Ser. No. 382,658

Int. Cl. B65d *81/32, 31/12*

U.S. Cl. 206—219 **4 Claims**



1. A package adapted to hold at least two separate ingredients which react in a liquid to evolve a gas, said package comprising,

a plurality of liquid porous membranes joined along at least a substantial portion of the peripheral extent of the package to form at least a pair of separate ingredient pouches, predetermined quantities of said one ingredient and the other of said ingredients being disposed separately in said respective pouches, and

said package including means separate from the liquid porous property of said membranes to provide for controlled dissolved solutes mixing to cause reaction and forming of gas over a short period of time when said package is submerged in a liquid to insure a complete and rapid reaction between said ingredients and said liquid.

3,871,519

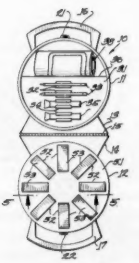
BINGO CARRYING CASE

Jacqueline Groomes, 40 E. Sidney Ave., Mount Vernon, N.Y. 10550

Filed Dec. 26, 1973, Ser. No. 427,588

Int. Cl. B65d *11/02*; **A45c** *11/29*

U.S. Cl. 206—223 **5 Claims**



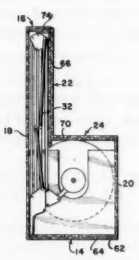
1. A Bingo carrying case adapted for the carrying of the various items required for use in the play of the game of Bingo, the carrying case comprising a housing bisected into two substantially identical sections, each of said sections having a substantially circular body portion with a semi-oblong cross-section, each circular section terminating in a base member at one end and having a handle member at the opposite end, adjacent bottom edges of each of said base members being pivotally attached together to provide swinging movement of said sections relative to each other between a case opened position and a case closed position, latch means disposed

adjacent said handle members on each of said sections and adapted to detachably attach said sections in their respective closed positions, said first section having an astrological sign disposed on the exterior surface thereof, said first section having interiorly thereof a circular platform, means on said platform for retaining a plurality of tandemly disposed Bingo chips thereon, a plurality of Bingo chips each being of a substantially flat circular configuration with each having an astrological sign disposed on at least one face thereof with said sign being the same general sign as disposed on the exterior surface of said section, said second section having disposed interiorly thereof a substantially flat semi-circular platform, a first pair of resilient means disposed on said platform and adapted to resiliently retain a pair of pencils and the like therein, a second pair of resilient means disposed on said platform and adapted to retain a pair of markers and the like therein, said resilient means being disposed along a vertical diametric axis of said platform and extending at right angles thereto along the plane of said platform, said platform having a terminal edge defining with said section a semi-circular pocket type compartment, and a Bingo chip apron rolled up onto itself and received in said pocket with said apron having disposed on the face surface thereof an astrological sign of the same type as found on said Bingo chips and said section member.

3,871,520
CARTON FOR LAMP AND THE COMBINATION THEREOF

William C. Hand, Wilton, Conn., assignor to Luxo Lamp Corporation, Port Chester, N.Y.

Filed Feb. 13, 1974, Ser. No. 441,935
Int. Cl. B65d *5/50, 5/00, 85/30*
U.S. Cl. 206—320 **7 Claims**

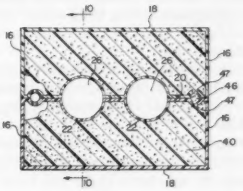


1. A closed carton for a lamp of the type having a flared shade assembly with a small end which is attached to a support arm assembly, said carton having a main cavity which is substantially cubical and within which the shade assembly is positioned and an extension cavity in which a portion of the arm assembly is positioned, said carton having a first vertical wall which is common to said main cavity and said extension cavity, said main cavity having a second vertical wall which is parallel to said first wall and having a right angle extension which forms a top wall for said main cavity and a second vertical wall for said main cavity, third and fourth parallel vertical side walls for said main cavity, a fold-in extension on said fourth vertical wall having a first panel which is positioned at an acute angle with respect to said fourth vertical wall and which is connected to a second panel along a fold, said second panel having its edge opposite said fold portion connected to a third panel at substantiallly the bottom of said main cavity, said third panel being bifurcated to form two extensions which are positioned upon the opposite sides of said shade with a curved edge which engages said shade and provides support therefor, and additional panels to provide a closed carton.

3,871,521
SHOCK-PROOF CONTAINER AND METHOD FOR MAKING SAME

Richard R. Szatkowski, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 237,194, March 22, 1972, abandoned. This application May 15, 1972, Ser. No. 253,371
Int. Cl. B65d *81/02;* **B65b** *23/00*
U.S. Cl. 206—524 **11 Claims**



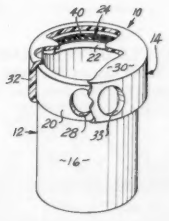
1. An improved container comprising two hollow shells each constructed of one-piece polymeric material, a surface of one shell mating with a surface of the remaining shell, said mating surfaces defining therebetween a container interlocking as well as parting area, said surfaces having apertures therein for permitting communication between the shells, an article containing space between said surfaces, and cellular plastic material filling each of said shells and interlocking said shells together across said area through said apertures to protectively encapsulate an article within said article containing space while permitting said shells to be parted across said parting area for the removal of an article from said article containing space.

10. A process of containerizing an article comprising the steps of providing two hollow one-piece shells having apertured mating surfaces having therebetween a container interlocking as well as parting area, placing an article between said surfaces, and introducing expandable liquefied plastic foams in said shells and positioning said mating surfaces contiguous each other whereby said foams upon expansion will interlock the shells to each other through the aperture thereof.

3,871,522
SELF-CLOSING SAFETY CONTAINER FOR MEDICINAL TABLETS

Marshall H. Feldman, P.O. Box 922, Twenty-Nine Palms, Calif. 92227

Filed Apr. 23, 1973, Ser. No. 353,494
Int. Cl. B65d *83/04*
U.S. Cl. 206—540 **1 Claim**



1. A self-closing, safety container for medicinal tablets or other hazardous articles, comprising:

a container body consisting of a cylindrical side wall, having a closure at the bottom end thereof;

a cup-shaped cap rotatably mounted on the open top end of said container body, said cap having an annular cylindrical skirt projecting down over the top edge of said cylindrical side wall;

both said cylindrical side wall of said container body and said cylindrical skirt of said cap having apertures provided therein which can be registered with respect to one another to form an exit opening, through which pills can be discharged;

an arcuate shelf-like projection extending laterally inward from the inner surface of said cylindrical side wall of said container body at the top end thereof substantially opposite the aperture in the side wall, said projection having an upwardly opening channel having closed ends;

a helical compression spring lying within said channel, and having one of its ends abutting against the adjacent end of the channel; and

a protuberance projecting downwardly from the underside of said cap into said channel, said protuberance engaging the other end of said compression spring, whereby rotation of said cap to align said apertures causes said compression spring to be compressed by said protuberance, so that when the cap is released, the spring rotates the cap to displace the apertures in the cap from the aperture in the side wall.

3,871,523

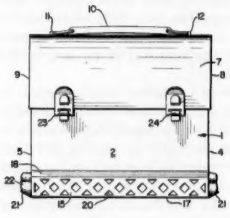
AUXILIARY COMPARTMENT FOR A LUNCH BOX

Alvin Lee Bassett, 3414 Renick St., Saint Joseph, Mo. 64507

Filed July 12, 1973, Ser. No. 378,673

Int. Cl. A45c *11/20*

U.S. Cl. 206—542 **7 Claims**



1. In combination, a lunch box comprising an open-ended, substantially rectangular lower box portion having means to attach a top section thereto, said top section having substantially parallel end-walls and converging front and rear walls, wherein said lower box portion of said lunch box has, subjacent thereto and contiguous therewith, a substantially rectangular open-ended compartment extending substantially along the width and length of said lower box portion of said lunch box.

3,871,524

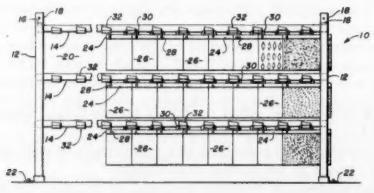
SAMPLE DISPLAY RACK

Larry R. Helf, 110 South Queen St., York, Pa. 17403

Filed June 22, 1973, Ser. No. 372,644

Int. Cl. A47f *7/16*

U.S. Cl. 211—45 **2 Claims**



1. The combination of a display rack for simultaneously supporting a substantial number of elongated supporting members adapted to be connected to one edge of and support a plurality of planar samples of material of similar predetermined areas and shapes but different visual characteristics, said supporting members each having a rectangular bail-like handle provided with a straight bight portion and the ends thereof extending downward and connected to one edge of said supporting members midway of the opposite ends thereof, and said rack comprising a bar having at least one flat vertical surface, means adapted to support said bar substantially horizontally, a series of similar hook-like members formed from rigid sheet material and each having one edge fixedly secured to said flat vertical surface of said bar at evenly spaced locations; each hook-like member having opposite side edges located within substantially parallel vertical planes transverse to said bar, one side edge of each hook-like member being longer than the other, the longer edge extending outward and downward from said flat vertical surface of said bar and said shorter edge extending substantially only downward, the lower edge of said member terminating in an elongated channel which is U-shaped in cross-section and disposed within a horizontal plane parallel to and substantially coincident with the lower surface of said bar and said longer and shorter edges of said member disposing the axes of said channels at similar acute angles to said flat vertical surface of said bar to receive said handles of said supporting members to support the same thereon, the spaces between the medians of said channels of said hook-like members being substantially equal to half the width of said supporting members for said samples to be supported upon said channels of said hook-like members, whereby when a plurality of said similar planar samples are suspended upon said hook-like members, they will be disposed within vertical planes arranged shingle fashion relative to each other and substantially one-half of each sample will be exposed to view to render the entire assortment of samples readily observable for selection and the position of said handles midway of the upper edges of said supporting members insuring horizontal suspension of said upper edges of said samples relative to said hook-like members.

3,871,525

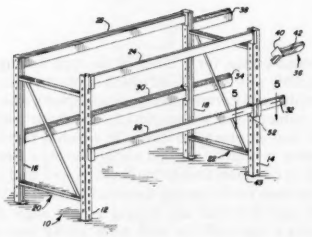
SAFETY CONNECTOR FOR KNOCK-DOWN RACKS

Adam M. Al-Dabbagh, Chicago, and Leonard J. Dudzik, Dolton, both of Ill., assignors to Unarco Industries, Inc., Chicago, Ill.

Filed Apr. 23, 1973, Ser. No. 353,658

Int. Cl. A47f *5/10*

U.S. Cl. 211—176 **3 Claims**



1. In a knock-down storage rack which includes apertured, upright posts of generally rectangular cross-section and beam members having ends constructed and adapted for selective connection and disconnection to the posts to provide the storage rack construction, the improvement comprising, in combination, the post providing a front face and a side face transverse to each other, and each provided with a series of spaced apertures, the apertures in the front face each being vertically elongated and having a lower support edge, each end construction of the beam being in the form of a unitary plate shaped to provide a side-engaging portion adapted for

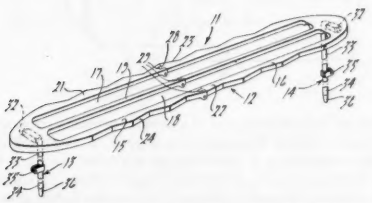
attachment to the cross-beam on one surface thereof and substantial surface abutment against a side face of the post by the other surface thereof, and a hooking flange spaced from but substantially parallel to the side-engaging portion, the side-engaging portion being of greater dimension than the end of a beam and providing an exposed section located outwardly of the beam, safety pin means carried on the exposed section of the side-engaging portion and having a locking head adapted for entry into one of the series of apertures in the post's side when the beam is properly positioned on the post, the hooking flange having an elongated edge for bracing abutment with the face of the post and a plurality of hooks extending outwardly of said bracing edge adapted for entry into a plurality of apertures in the post's front face for simultaneous supporting engagement with the support edges of the apertures, the connector hooks and said pin being positioned on said plate such that when said hooks are seated in the hook-receiving apertures and said pin is positioned in said pin-receiving aperture, said pin is in spaced non-load-bearing relation with the edges of said pin-receiving aperture, said pin-receiving aperture being elongated and having a widened portion through which said locking head of the pin is extendable and said aperture having narrower upper and lower portions behind which the head of said pin is positionable, and the side-engaging portion of said plate being recessed so as to receive the locking head of said pin therein.

3,871,526

TOWEL RACK FOR USE ON BEACHES

Warren S. Marsack, 5075 Nottingham, Detroit, Mich. 48224

Filed July 26, 1973, Ser. No. 382,870
Int. Cl. A47k *10/04*
U.S. Cl. 211—178 **6 Claims**



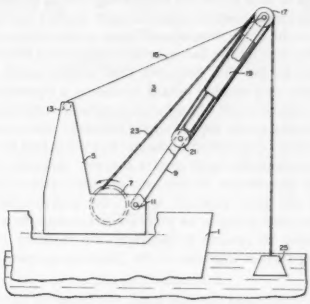
1. A towel rack for use on beaches comprising an elongated body of a proper size to accommodate a towel which may be placed thereon, whereby a midportion of the towel will rest on the body, said body being made up of at least two sections, each section having an integral outer end portion and a plurality of parallel bars extending inwardly therefrom to define towel-receiving slots therebetween, hinge means connecting the bars of said two sections permitting pivotal movement thereof from a horizontally aligned, opened position to a folded, collapsed position, whereby said slots will be continuous along the entire extent of said body when the sections are opened, the axis of said hinge means being horizontal when the body is in its open position whereby one section may be folded under the other to collapse the body, said hinge means including stop means for preventing collapse of the body in the opposite direction beyond its open position when a towel rests thereon, a pair of legs extending from said opposite end portions of said body and of sufficient length to permit them to be stuck into the sand to support the body high enough so that a towel supported thereby will not touch the sand while being dried, means mounting the upper ends of said legs on said outer end portions of said body so as to permit the legs to be moved between extended positions perpendicular to the body and folded positions parallel to the body section, the width of said body being substantially less than the length of said legs, whereby the body will be supported only by said pair of legs when stuck in the sand, and the assembly may be easily carried when the legs are folded.

3,871,527

RAM TENSIONING DEVICE

Werner K. Schimmeyer, Los Altos; Norman J. Wood, San Jose, and Joseph V. McCargar, Los Altos, all of Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 4, 1973, Ser. No. 347,980
Int. Cl. B66c *23/52*
U.S. Cl. 212—3 **6 Claims**



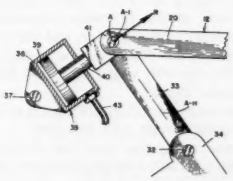
1. A boom in combination with a drum and cable for hoisting a load and a ram tensioning device attached to said boom and cooperatively associated with said cable, said ram tensioning device comprising a tubular housing, a first movable abutment slidably disposed within said housing, a second movable abutment slidably disposed within said housing, a rod extending from one of said abutments and extending beyond said housing, said housing having a closed end, a first chamber disposed between said closed end and said first movable abutment, a second chamber disposed between said first and second abutments, means for supplying pressurized gaseous fluid to one of said chambers, and means for supplying hydraulic fluid to the other of said chambers at a pressure greater than the gaseous fluid, whereby during operation the gaseous fluid maintains a generally constant tension on the cable and the hydraulic fluid is utilized to rapidly lift the load.

3,871,528

LOAD CONTROL APPARATUS FOR CRANES

Alvin H. Wilkinson, Post Office Box 3808, Utica Square Station, Talala, Okla. 74152

Division of Ser. No. 846,387, July 31, 1969, Pat. No. 3,612,294. This application May 11, 1971, Ser. No. 142,210
Int. Cl. B66c *13/48*
U.S. Cl. 212—39 R **1 Claim**



1. In a hoisting apparatus having a superstructure, a boom pivotally supported on said superstructure at a hinge point spaced from the center of gravity of said hoisting apparatus, said boom being movable in a vertical plane about said hinge point, a variable length boom support means connected at one end to the free end of said boom and at its other end to an anchor adjacent said superstructure for moving said boom

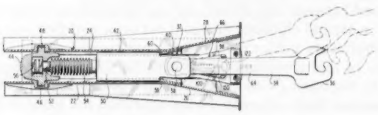
into different angular positions in said vertical plane, a rigid beam having a longitudinal center line substantially colinear with the line between said anchor point and said hinge point, said beam being pivotally connected at one end to said superstructure adjacent said anchor point, the other end of said beam extending free from said superstructure and being connected to said other end of said boom support means for constituting said anchoring point, hoisting means connected to free end of said boom for supporting a load therefrom, and sensing means mounted adjacent said anchor point and responsive to the deflection of said beam at the anchor point end thereof for sensing the force on said beam in a direction perpendicular to the line between said anchor point and said hinge point, said sensing means including a hydraulic piston-cylinder unit, one end of said piston-cylinder unit being pivotally connected to the superstructure and the other end thereof being pivotally connected to the anchor point end of the beam and at substantially right angles thereto, whereby increased transverse movement of the anchor point end of the beam increases the fluid pressure within the piston-cylinder unit, and means responsive to an increase in pressure to a predetermined value to render inoperative the hoisting means for preventing further increase in the pitching moment.

3,871,529

INTEGRAL COUPLER CENTERING DEVICE

Darrell D. Dial, Fort Worth, and Robert J. von Bose, Arlington, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 22, 1974, Ser. No. 453,926
Int. Cl. B61g 7/12
U.S. Cl. 213—21 **18 Claims**



1. An apparatus for centering a railway car coupler bar with respect to a longitudinal center line of the railway car, said coupler bar extending into a car underframe center sill and being pivotally connected to a cushioning mechanism mounted within said center sill for translation and dissipation of at least impact forces imparted to said coupler bar, said apparatus comprising

coupler carrier means connected at one end to said cushioning mechanism and longitudinally extending along and generally underlying a shank portion of said coupler bar, said coupler carrier terminating at a distal end thereof in operative contact with said shank for supporting said shank in swinging movement with said center sill;

right hand arm means pivotally connected at one end thereof to said coupler carrier, and including

means connected to the other end of said right hand arm means for operably engaging a first lateral surface of said coupler shank;

left hand arm means pivotally connected at one end thereof to said coupler carrier, and including

means connected to the other end of said left hand arm means for operably engaging a second lateral surface of said coupler shank;

means connected to said right and left hand arm means for biasing said arm means to mutually pivot together at said other ends thereof; and

means interposed between said other ends of said right and left hand arm means for interfering with free pivotal movement of said right and left hand arm means wherein said means for interfering operably

maintains one of said right and left hand arm means stationary when said coupler shank swings in one direction and pivots the other of said arm means away from said one arm means in the direction of coupler swing wherein said means for biasing will exert a restoring force upon said coupler shank through said other of said arm means tending to return said coupler bar to longitudinal alignment with said center sill structure, and further operably

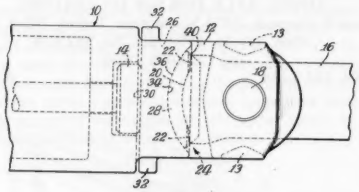
maintains the other of said right and left hand arm means stationary when said coupler shank swings in the other direction and pivots said one of said arm means away from said other means in the direction of coupler swing wherein said means for biasing will exert a restoring force upon said coupler shank through said one of said arm means tending to return said coupler bar again to longitudinal alignment with said center sill structure.

3,871,530

SWAY FOLLOWER ASSEMBLY FOR RAILWAY CAR COUPLER

Michael W. Ray, Tinley Park, Ill., assignor to Miner Enterprises, Inc., Chicago, Ill.

Filed Dec. 3, 1973, Ser. No. 420,777
Int. Cl. B61g 9/00
U.S. Cl. 213—69 **5 Claims**



1. For use with the butt end of a coupler pivotally connected for lateral swinging movement to a yoke, a sway follower assembly comprising a rear follower member having a forwardly facing vertically oriented concave cylindrical surface, a front follower member having a rearwardly facing convex cylindrical surface engaging said concave surface of said rear follower member, said front follower member having a forwardly facing concave surface engaging and interfitting with the butt end of the coupler, and said front follower member being arcuately movable within said rear follower member to accommodate lateral swinging movement of the coupler relative to said rear follower member.

3,871,531

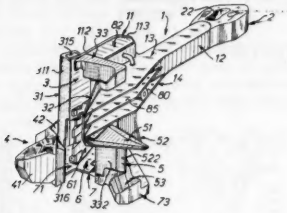
AUTOMATIC CENTRAL BUFFER COUPLINGS FOR RAIL VEHICLES

Georges Paul Dailly, 5, rue G. Bostarron, and Raymond Marcel Lefebvre, 7, rue G. Bostsarron, both of 59590 Raismes (Nord), France

Filed Dec. 13, 1973, Ser. No. 424,452
Claims priority, application France, Dec. 13, 1972, 72.44288; Dec. 4, 1973, 73.43130
Int. Cl. B61g 3/10
U.S. Cl. 213—100 W **35 Claims**

1. In an automatic central buffer coupling including a coupling arm having a forward end and a rearward end, a buffing jaw and a pulling jaw at the forward end of the arm, a pivot member at the rearward end of the arm, a frontal plate between the buffing and pulling jaws, the frontal plate defining an aperture, latching means in the aperture in the frontal plate, two side walls delimiting below the frontal plate a conduit passageway, and a bottom member closing the bottom of

the passageway, the improvement that comprises the assembly by welding of the coupling components about a master member which extends continuously from the buffing jaw to the pivot member.



3,871,532

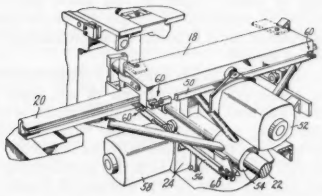
WORKPIECES MOVING APPARATUS

Adolph S. Dorosz, Beverly; Hans F. Schaefer, Jr., Rockport, and Gordon V. Sprague, Jr., Danvers, all of Mass., assignors to USM Corporation, Boston, Mass.

Division of Ser. No. 192,287, Oct. 26, 1971, abandoned. This application Jan. 29, 1973, Ser. No. 327,847

Int. Cl. B66c *1/00*

U.S. Cl. 214—1 BB **1 Claim**



1. A coupling device for resiliently mounting a pinion driven rack to a workpiece support which is mounted for movement with the rack comprising:

A. a toothed rack constructed for engagement with a motor drive pinion;

B. a workpiece support mounted for movement in operative relation through the rack to the motor driven pinion;

C. first mounting surfaces, one at each end of the rack, the plane of said surfaces being parallel to the direction of movement of the rack;

D. second mounting surfaces each of which is constructed on the workpiece support for adjacent alignment with a respective first mounting surface; and

E. a pair of resilient leaf springs secured across the adjoining first and second mounting surfaces at each end of the rack to mount the rack to the workpiece support in a manner which provides for direct, non-resilient transmission of the drive forces from the pinion through the rack to the workpiece support and allows for resilient displacement between the rack and the workpiece support to compensate for other interacting forces.

3,871,533

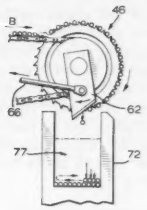
ROD BUNDLING AND STACKING APPARATUS

Joseph Aloysius Mulcahy, Brooklin, Ontario; Harry Joseph Jones, Bowmanville, Ontario, and Stephen Douglas Batram, Oshawa, Ontario, all of Canada, assignors to Ferrco Engineering Limited, Whitby, Ontario, Canada

Filed Mar. 29, 1973, Ser. No. 345,856

Int. Cl. B65g *57/00*

U.S. Cl. 214—6 FS **3 Claims**



1. Apparatus for stacking metal rods for bundling, comprising:

conveyor means for moving laterally a plurality of said rods horizontally disposed;

rotatable magnetic means oriented to pick up said rods from the conveyor means and move the rods in a horizontal cylindrical locus, said magnetic means comprising a plurality of spaced, coaxially aligned wheels rotatable together and each carrying a magnetic rim defining the cylindrical locus;

peeling means subsequently to separate each moving rod successively from the magnetic means substantially parallel to the axis of the locus and below the horizontal axial plane of the cylindrical locus, each separated rod being oriented substantially parallel to the axis of the cylindrical locus, said peeling means comprising a plurality of members one adjacent each of said wheels, the members each having a free edge intersecting the cylindrical locus and oscillatable together in an arc in said locus, the free edges of the members being aligned; and

a cradle located beneath the magnetic means to receive each rod dropping successively therefrom.

3,871,534

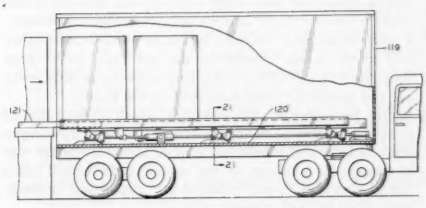
WALKING BEAM CONVEYOR

Max Hubert Bursk, 30603 Winston Dr., Bay Village, Ohio 44140

Filed July 28, 1972, Ser. No. 275,954

Int. Cl. B60p *1/00*

U.S. Cl. 214—83.3 **14 Claims**



1. A walking beam conveyor comprising, a base, a plurality of spaced cam plates disposed in line on said base, each cam plate having a top horizontal flat surface including downwardly sloped opposite end portions, interconnected carriages

rollably disposed on the top surface of the cam plates for limited longitudinal reciprocable movement thereon, carriage reciprocating means for reciprocating said carriages on the cam plates, at least two pair of inner and outer elongated walking beams rollably disposed on said carriages in parallel horizontal relationship for limited horizontal movement thereon whereby each pair of beams is supported on the interconnected carriages, and beam reciprocating means for moving said beams horizontally, said interconnected carriages moving the respective pairs of beams vertically when the carriages are moving on the respective downwardly sloped end portions of said cam plate top surface, said first and second-named means operating in preselected timed sequence whereby at least one pair of beams is always in contact with an associated load alternately carried by said beams and moving such load horiziontally at constant speed in one horizontal plane, said carriages including spaced pairs of interconnected triangular end plates having rollers disposed at the apexes of each triangle, each pair of end plates being connected together at a common apex.

3,871,535

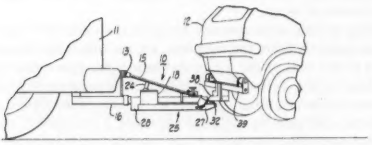
VEHICLE HITCH

Joseph G. Fenske, 5929 W. 149th St., Brook Park, Ohio 44142

Filed Jan. 2, 1974, Ser. No. 430,041

Int. Cl. B60p *3/12*

U.S. Cl. 214—86 A **2 Claims**



1. A vehicle hitch for connecting a towing vehicle to a vehicle to be towed, comprising in combination:

a. a stationary hollow beam mounted on the rear frame of the towing vehicle, extending rearwardly therefrom in a horizontal plane;

b. a boom swivelly mounted on the underside of the beam for free swinging movement in both vertical and horizontal planes;

c. said boom comprising two telescopically interfitted inner and outer sections;

d. the outer section having a ball adapted to be engaged by a tow cap mounted on the vehicle to be towed;

e. the telescopic boom being of a length such that the ball will be positioned immediately beyond the free end of the beam when the boom is in its fully retracted condition;

f. a cable secured at one end to the beam and at its other end to the boom, proximate the ball; said boom end, supported by the cable, being free to swing in both vertical and horizontal planes relative to the beam;

g. means for increasing the effective length of the cable to permit the boom to be lowered, lengthened and swung in both vertical and horizontal arcs, to allow the boom ball to engage the ball cap on the vehicle to be towed when the towing and towed vehicles are misaligned immediately prior to their joinder; and

h. means for shortening the effective length of the cable to raise and shorten the overall length of the boom and move it into alignment with the beam, against the underside thereof, thereby lifting the rear wheels of the vehicle to be towed off the ground, with the rear axle thereof in exact alignment with the towing vehicle.

3,871,536

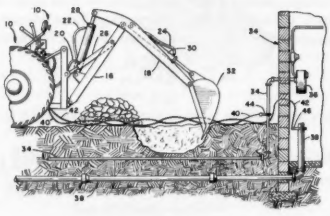
UNDERGROUND PIPE WARNING AND IDENTIFICATION SYSTEM

James R. Brown, 875 Richey Rd., Zanesville, Ohio 43701

Continuation-in-part of Ser. No. 298,583, Oct. 18, 1972, Pat. No. 3,817,411. This application Dec. 19, 1973, Ser. No. 425,971

Int. Cl. E02f *9/24*

U.S. Cl. 214—138 R **3 Claims**



1. A warning system for an excavating apparatus having an electrically conductive tool, comprising:

means connecting said conductive tool to a point of reference potential and to one side of a source of operating potential;

input means adapted to be connected with the other side of said source of operating potential;

an alarm circuit connected with said input means and having an input terminal and comprising alarm means, said alarm means being responsive to the receipt of a generating signal on said input terminal to establish a perceptible warning signal;

a plurality of sensor means in said alarm circuit, each adapted to be connected to a respective one of a plurality of underground pipes at points above ground level and to said alarm means;

switch means initially in a position for completing the alarm circuit whenever a particular one of said pipes is contacted by said tool whereby said alarm means is actuated and then being selectively operable to connect only the contacted one of said pipes with its respective sensor means with said alarm means so that the particular underground pipe contacted by said tool may be readily identified;

solenoid means being provided in said alarm circuit and being responsive to the contact of said tool with an underground pipe for automatically disabling the excavating apparatus; and,

by-pass switch means in said alarm circuit with the solenoid means for selectively deactivating said solenoid means while maintaining active the alarm means.

3,871,537

CONTROL FOR MOBILE CONSTRUCTION MACHINE

Gerald W. Bernhoft, Wauwatosa, and David A. Miller, New Berlin, both of Wis., assignors to Koehring Company, Milwaukee, Wis.

Division of Ser. No. 195,581, Nov. 4, 1971, Pat. No. 3,773,084. This application Mar. 26, 1973, Ser. No. 344,773

Int. Cl. E02f *3/28*

U.S. Cl. 214—140 **2 Claims**

1. In a mobile construction machine including: a motor operator tool;

first and second motor means for moving said tool through first and second operational phases;

a manually operable control lever for selectively controlling said first motor means; and

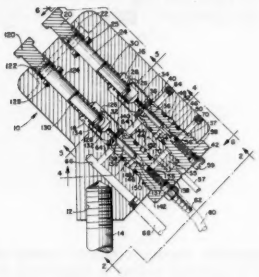
the improvement comprising:

manually operable metering valve means for selectively controlling pressure responsive fluid circuitry including inlet means and

outlet means for controlling said second motor means, said metering valve means mounted on said control lever for metering flow of fluid through said metering valve means for precise control of said second operational phase of said tool, said metering valve means including;

a body including an axial bore extending therethrough, said body also including an inlet port, an exhaust port, and a signal port communicating with said axial bore, said port being connected to the inlet means of said fluid circuitry,

an annular valve seat defined within said body,



plunger means mounted for axial movement within said axial bore between unactuated and fully actuated positions,

supply means connected to said inlet port for delivering pressurized fluid thereto,

normally opened valve means situated within said axial bore in a posture axially displaced from said plunger means for metering the flow of fluid passing between said inlet port and said exhaust port, said valve means being operatively connected to said axially displaced plunger means for axial movement relative to said valve seat and relative axial movement with respect to said plunger means, and

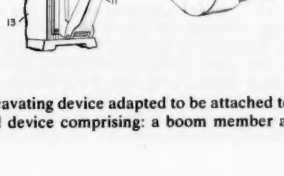
said plunger means when actuated, operably moving said valve toward said valve seat to produce a modulated pressure signal at said signal port that is fed to the inlet means of said fluid circuitry, said signal being proportional to the extent of movement of said plunger means.

3,871,538

ROTARY EXTENDABLE DIPPERSTICK

Laurence B. Miller, and James D. Crook, both of 354 Tennessee, Redlands, Calif.

Filed Dec. 27, 1971, Ser. No. 211,879
Int. Cl. E02f *3/28*
U.S. Cl. 214—141 **10 Claims**



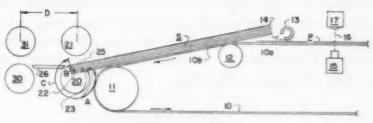
1. An excavating device adapted to be attached to transport means, said device comprising: a boom member attached at one of its ends to transport means; a support frame connected to the other end of said boom member; motor means attached to said support frame; a non-extendable shaft connected at one of its ends to said motor means; said motor means being adapted to revolve said shaft about its longitudinal axis; a hollow member having one of its ends adapted to slideably and telescopically receive therein the other end of said shaft; said hollow member being entirely supported by said shaft; means comprising a piston and cylinder assembly which is attached at one end to said shaft and at the other end to said hollow member so as to be able to extend or retract the effective combined length of said hollow member and shaft by causing movement of said member along its longitudinal axis relative to said shaft; an excavating tool such as a backhoe bucket connected to the other end of said hollow member; said hollow member and shaft being adapted to cooperate with each other so that when said shaft revolves about its axis, as aforesaid, the said hollow member and tool will likewise revolve about the longitudinal axis of said hollow member; and means carried by said hollow member and adapted to actuate said tool.

3,871,539

PANEL COUNTING, COLLECTING AND GATING METHOD

Willem A. Nikkel, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 184,875, Sept. 29, 1971, Pat. No. 3,785,256. This application July 23, 1973, Ser. No. 381,891
Int. Cl. B65g *57/30*
U.S. Cl. 214—152 **3 Claims**



1. A method of assembling panels of thin sheet material into face-to-face stacks comprising a discrete number of said panels, said method comprising the steps of:

a. delivering panels of thin sheet material in a substantially continuous series sequence to a collecting station;

b. counting said panels delivered to said station;

c. accumulating said panels at said station in a face-to-face stack by addition of panels to one face side of said stack;

d. aligning the leading edges of said stacked panels against an abutment element;

e. moving a leading edge portion of said stack upon the accumulation of a predetermined number of said panels in the direction of and substantially perpendicular to the other face side of said stack and into nip engagement between first and second rolls disposed for rotation about axes on opposite face sides of said stack;

f. simultaneous with said leading edge moving step, rotatively withdrawing said abutment element about an axis coaxial of said first nip roll disposed on said one face side of said stack;

g. advancing said stack within said station by a single revolution of said first nip roll;

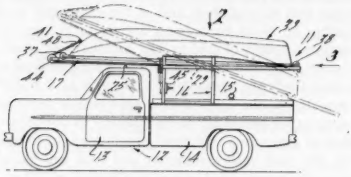
h. returning said abutment element to said panel edge aligning position simultaneously with the completion of said first nip roll single revolution; and,

i. removing said advancing stack from the proximity of said collecting station.

3,871,540
DEVICE FOR LOADING AND CARRYING BOATS ON PICKUP TRUCKS

Otto L. Jenkins, Union Lake, Mich., assignor to Smitty's Easy Tow, a part interest

Filed Dec. 12, 1973, Ser. No. 424,043
Int. Cl. B60p 3/10
U.S. Cl. 214—450 13 Claims

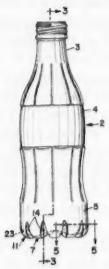


1. A device for loading and carrying inverted boats on pickup trucks comprising a fixed frame and a swingable frame, said swingable frame having side portions and being capable of receiving and supporting a boat thereon, means on said fixed frame pivotally supporting an intermediate portion of said swingable frame on a fixed pivot relative to both said fixed and swingable frames above the box of said pickup truck at approximately cab top level, the swingable frame being pivotable but non-slidable with respect to said fixed frame on said fixed pivot between an inclined position in which a boat may be moved upwardly onto the swingable frame, and a generally horizontal carrying position, extension means disposable between said swingable frame and the ground when the swingable frame is in its inclined position to provide a track so that a boat may be shifted along said extension means and completely onto said swingable frame, and means on said fixed frame for engaging and locking said swingable frame to said fixed frame when in said carrying position, said swingable frame having a track intermediate the side portions thereof for supporting rollers on the forward and after portions of said boat when the latter is inverted.

3,871,541
BOTTOM STRUCTURE FOR PLASTIC CONTAINERS

Domas Adomaitis, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,974
Int. Cl. B65d 23/00
U.S. Cl. 215—1 C 8 Claims



1. A blow molded pressure resistant plastic container having a body comprising a generally cylindrical side wall and a bottom structure, said bottom structure comprising:

a central dome portion terminating in a circular bottom edge;

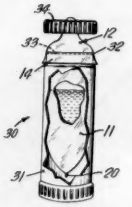
a semi-torus shaped rim portion circumscribing said central portion and convexed downwardly from said container and having an outer marginal edge portion merging into said side wall and having an inner marginal edge portion merging with said dome portion at said circular edge; and

a plurality of shallow ribs formed in said rim portion of transverse arcuate contour and intervening radially extending leg portions, each rib portion having a relatively thick ridge section and having side sections progressively thinned outwardly and merging into respective leg portions.

3,871,542
DISPOSABLE NURSING CONTAINER

Ilse M. Hammer, 46 Place Kieffer, Dollard des Ormeaux, Quebec, Canada

Filed Sept. 24, 1973, Ser. No. 400,383
Int. Cl. A61j 9/00
U.S. Cl. 215—11 E 9 Claims



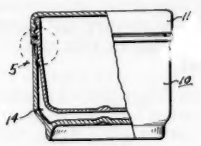
1. A disposable nursing container comprising a body of flexible sheet material having a nipple end formed integral therewith, at least one flexible skirt member of sheet material has an edge thereof secured to said body for engaging said container in a holding device with said nipple end protruding from an end of said holding device, and a sealable open end to permit a liquid to be inserted and sealably retained in said body.

9. A disposable nursing container as claimed in claim 1 in combination with a bottle having at least one open end, an end edge about said open end, a cap having an opening therein and securable about said end edge, said nursing container being retained in said bottle with said at least one skirt overlapping said end edge and retained thereabout by said cap, said nipple extending through said cap opening.

3,871,543
DOUBLE-WALL JAR

Robert Chadfield, Forest Hills, Minnetonka, Minn., and Frank J. Lang, Lemont, Ill., assignors to Federal Package Corporation, Minneapolis, Minn.

Filed Jan. 2, 1974, Ser. No. 429,784
Int. Cl. A47j 41/00; B65d 11/16
U.S. Cl. 215—13 R 14 Claims



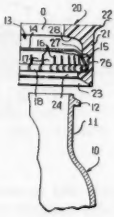
1. A double wall jar comprising an inner cup nested within an outer cup, the inner cup having an annular shoulder at the upper end providing an abutment for the upper edge of the outer cup, the outer surface of the inner cup being spaced from the inner surface of the outer cup except at the upper ends of the wall of each cup, a plurality of axially aligned teeth at the upper edge of inner wall of the outer cup and a plurality

of axially aligned teeth below the shoulder at upper end of the outer wall of the inner cup, said teeth being in interlocking engagement to prevent relative rotary motion between the two cups, a peripheral inwardly-extending groove in the outer wall of the inner cup directly adjacent the said teeth and a peripheral inwardly-extending rib on the inner wall of the outer cup directly adjacent the said teeth, said rib being snap-fitted into the said groove upon assembly of the two cups and preventing axial displacement between the said cups.

3,871,544
CHILD-PROOF CLOSURE CAP

Harry A. Peyser, Olympia Fields, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Oct. 24, 1972, Ser. No. 300,146
Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*
U.S. Cl. 215—225 **3 Claims**



1. A closure comprising an inner-cap defined by an end panel and depending peripheral skirt terminating in means for releasable clamping securement to a container, said peripheral skirt being deflectable between an unlocked position at which the peripheral skirt is of a generally frusto-conical condition enlarging in a direction away from said end panel and a locked position at which the diameter of the peripheral skirt is lessened as compared to its maximum in said frusto-conical condition, means for moving said peripheral skirt from said unlocked to said locked position, said moving means being carried by a annular wall in external telescopic relationship to said peripheral skirt, said annular wall having confining means for entirely confiningly housing said inner-can within the axial length of said annular wall in said unlocked position, said confining means also constituting means for contact with said inner cap to aid positively in the urging of said inner-cap into said unlocked position during the raising of said cap from said container, and said annular wall further including means for retaining said peripheral skirt in said locked position after having been moved thereto by said moving means.

3,871,545
CLOSURE DEVICES FOR CONTAINERS

Andre Bereziat, Ecully, France, assignor to Astra Plastique, Saint Georges de Reneins, France

Filed July 16, 1973, Ser. No. 379,702
Int. Cl. B65d *41/38, 41/50, 41/62*
U.S. Cl. 215—249 **3 Claims**

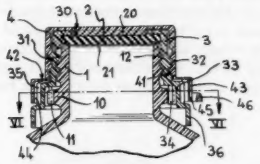
1. A closure device for closing the neck of a container, comprising:

an outer threaded portion on the container neck adjacent to the edge around the opening of the neck;

a perforatable closure disc overlying the edge about said opening;

a retaining member for maintaining said disc in sealed engagement with said edge about said opening, the retaining member having a substantially flat annular end wall overlying the periphery of said disc to press it against said edge and said annular end wall defining a central opening through the end wall exposing a portion of said disc for perforation, and the retaining member having a first annular skirt surrounding said neck and having an internal screw-threaded portion engaging said outer threaded portion to mount the retaining member on said neck, and said first skirt having an external screw-threaded portion therearound;

a cap covering said retaining member and having a closed end wall overlying the end wall of said retaining member and including an inwardly projecting boss portion enter-

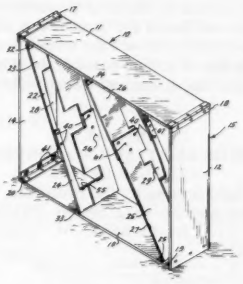


ing said central opening and abutting said portion of said disc, and the cap further including a second annular skirt surrounding said first annular skirt and having an internal screw-threaded portion engaging said external threaded portion to secure the cap on said retaining member; and said inner screw-threaded portion of said first skirt and said external screw-threaded portion thereof being of opposite hands.

3,871,546
COLLAPSIBLE BICYCLE CRATE

Neale Thompson, 2717 Hearst St., Elm Grove, Wis. 94709

Filed July 2, 1973, Ser. No. 375,711
Int. Cl. B65d *85/68*
U.S. Cl. 217—38 **7 Claims**



1. A collapsible shipping device for protecting a partially disassembled bicycle comprising: external wall portions defining a frame member, hinge means disposed in said frame member to effect a substantially complete collapse of said frame member, at least one internal wall member extending from one of said external wall portions to another of said external wall portions, at least one opening in said internal wall member to receive portions of said bicycle and means to removably secure said portions of said bicycle within said opening of said internal wall member.

3,871,547
CONTAINER CLOSURE

Franklin Eugene Wharton, 1308 Sartori Ave., Torrance, Calif. 90501

Filed May 21, 1973, Ser. No. 362,442
Int. Cl. B65d *45/00*
U.S. Cl. 220—287 **8 Claims**

1. A device for sealing an opening in the end wall of a container having at least one end wall and a sidewall wherein

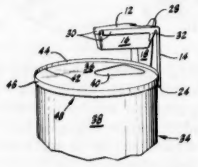
a first upwardly, from the end wall, and then outwardly and downwardly extending rim is peripherally formed at the juncture of the end wall and side wall of the container, which device comprises:

a. a first plate;

b. a pad of resilient material attached to one surface of the plate and adapted to sealingly close the opening in the end wall of container;

c. a second plate attached to the first plate so as to be at substantially right angles thereto in sealing position with the pad on the first plate being on the inside of the angle, the second plate being adapted to extend downwardly along the outside of the sidewall of the container in close proximity thereto when the device is in sealing position;

d. a tongue extending from adjacent the free end of the



second plate toward the attachment of the plates to one another, the tip of the tongue being spaced therefrom sufficiently and biased so as to slide along an extension of a diameter of the container under and bear against the lower surface of the rim of the container in sealing position, whereby the pad of resilient material is caused to sealingly close the opening in the end wall of the container; and

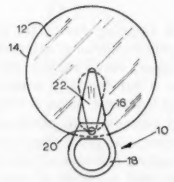
e. means for moving the tip of the tongue from beneath the rim of the container to release the device therefrom; and

f. a ridge adapted to extend downwardly along the end wall side of the rim of the container in close proximity thereto so as to co-act with the tongue in securely positioning the pad in sealing position, the ridge being in at least two sections, at least one on each side of the tongue.

3,871,548
METHOD OF RE-ATTACHING CONVENIENCE CLOSURE DEVICE

John Tanzer, 2605 St. Charles Ct., Brookfield, Wis. 53005

Filed Aug. 31, 1972, Ser. No. 285,766
Int. Cl. B65d *5/64*
U.S. Cl. 220—243 **4 Claims**



1. The method of re-attaching a tear strip closure having a generally key-hole shaped tear strip section and a finger tab section connected by a rivet portion to the marginal surfaces adjacent a generally key-hole shaped opening formed in a can top after complete removal of the generally key-hole shaped tear strip section from the can top, comprising the steps of:

inserting the separated year strip section into the generally key-hole shaped opening formed in the can top,

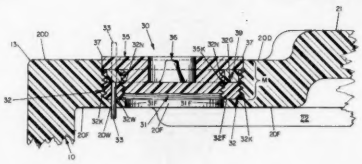
moving the tear strip section inwardly until the rivet portion is positioned in the reduced neck area of the generally key-hole shaped opening, and

then rotating the tear strip section by engagement and movement of the rivet portion thereof within the reduced neck area of the generally key-hole shaped opening and causing the finger tab section and/or tear strip section to engage the can top for re-attaching the tear strip closure.

3,871,549
CLOSURE ASSEMBLY FOR HOLLOW DRUM TYPE CONTAINERS

Raymond W. Kerr, 3731 N. 58th St., Lincoln, Nebr. 68529

Filed Nov. 7, 1973, Ser. No. 413,422
Int. Cl. B65d *41/04*
U.S. Cl. 220—288 **4 Claims**



1. A readily re-closeable and re-usuable container of the hollow drum type and stably uprightly surrounding a vertical-axis and comprising:

A. A floor-panel providing the drum lower end and transversely intersecting the said vertical-axis;

B. A tubular shell having a lower portion annularly connected to the floor-panel along a floor-annulus and extending uprightly therefrom in surrounding relationship to the said vertical-axis;

C. A roof-panel that loftily overlies the floor-panel and annularly connected to the upper portion of said tubular shell along a roof-axis that surrounds said vertical-axis; and

D. Said drum being provided with at least one closeable-opening through the structural material thereof and for charging dischargeable cargo into the drum hollow interior chamber, said closeable-opening comprising:

i. A tubular sleeve threadedly engaged at its outer-diameter with a bore in the drum structural material whereby the tubular sleeve abuttably rests upon a bottom-shelf structural extremity of the roof-panel;

ii. A plug type closure threadedly engaged with said tubular sleeve inner-diameter; and

iii. A retainer-pin means removably passing downwardly through the threaded tubular sleeve into roof-panel bottom-shelf to maintain said sleeve in a non-rotatable relationship to the roof-panel for an extended finite-duration.

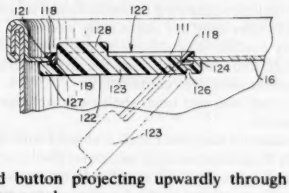
3,871,550
PUSH-IN EASY OPENING CONTAINER

Wayne T. Chiappe, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 29, 1973, Ser. No. 365,004
Int. Cl. B65d *41/00, 43/14, 51/04*
U.S. Cl. 220—339 **2 Claims**

1. An easy opening end closure for a container comprising a metal panel, an opening formed in said panel, a closure made from plastic material underlying said opening and having a closure flap, flexible means providing an attachment band ningedly attached to said flap and permanently bonded to the underside of said panel and marginal edge portions about said flap releasably bonded to the underside of said panel about said opening, and said closure having a relatively

inflexible thick button portion at one end and having a relatively thin flexible body portion between the band and button



and said button projecting upwardly through the opening above the panel.

3,871,551

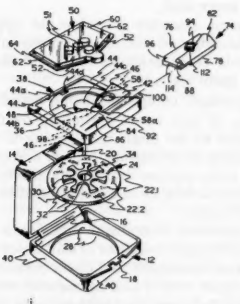
PILL DISPENSER WITH PILL ACTUATED TIME INDICATOR

Louis Bender, 4 Heather Ln., Scotch Plains, N.J. 07076

Continuation of Ser. No. 189,647, Oct. 15, 1971, abandoned. This application Jan. 30, 1974, Ser. No. 437,980

Int. Cl. B65d *83/04*

U.S. Cl. 221—8 **32 Claims**



1. A pill dispenser with an advancable time indicator actuated upon removal of a pill from the dispenser comprising

a pill dispenser housing provided with pill storing means and having a pill discharge port;

a pill time indicator movably mounted to the pill dispenser housing to advance to successive pill time indicating positions;

a pill transporter mounted to the pill dispenser housing for relative movement with respect to the pill time indicator towards a successive time indicating position thereof, said pill transporter being movable between a pill receiving position and a pill discharge position in operative registration with the pill discharge port;

said pill time indicator and the pill transporter being mounted to operate adjacent to each other and being selectively chaped to capture a single pill from the storing means at the pill receiving position for interlocking engagement of said pill time indicator with the pill transporter by the captured pill to enable operative movement of the pill transporter to advance the pill time indicator to a successive pill time indicating position and discharge the interlocking pill from the pill discharge port in the pill dispenser housing upon arrival of the pill transporter at said pill discharge position.

3,871,552

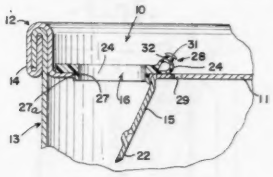
CONTAINER WITH EASY OPENING END UNIT

Lewis F. Irland, Palos Hills, and John B. Nicholson, Country Club Hills, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed June 15, 1973, Ser. No. 370,504

Int. Cl. B67b *7/24*; **B65d** *51/22*

U.S. Cl. 222—83 **13 Claims**



12. An easy opening container comprising a body with an end panel having a closure flap displaceable into said container to form a pour aperture therein, a tab located at one side of said aperture and having a bendable hinge portion fixedly secured to said panel adjacent to the aperture, said tab having a liftable portion with an opening therein, said liftable portion adapted to be swung 180° with attendant bending of the hinge portion to a position overlying said closure flap and having means for depressing said flap into the container upon pressure being applied to said tab, and vent-forming means connected to said hinge portion operable to form a vent in the end panel attendant to bending of the hinge portion upon lifting of the tab.

3,871,553

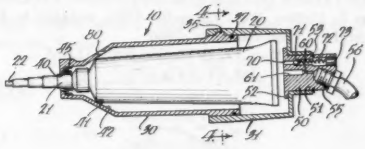
DISPENSING GUN FOR SEMI-LIQUID MATERIAL

Richard W. Steinberg, Owatonna, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.

Continuation of Ser. No. 341,341, March 15, 1973, abandoned. This application June 13, 1974, Ser. No. 478,878

Int. Cl. B65d *35/28*

U.S. Cl. 222—95 **4 Claims**

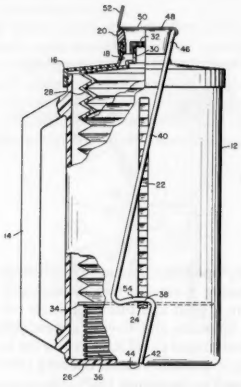


1. A dispensing gun for semi-liquid material carried in a collapsible tube and adapted for connection to a compressed air line in an industrial shop or the like comprising, a body defining an interior chamber for the tube, an outlet opening at one end of the body to receive the dispenser tip of the tube, a pressure air inlet orifice adjacent the other end of the body to limit the air flow into the chamber and reduce the pressure thereof, a pair of air outlet orifices from said body both of a size greater than said air inlet orifice, one of said outlet orifices being a pressure relief passage and a ball check valve positioned to close said pressure relief passage, a spring acting on said ball check valve, the other air outlet orifice being selectively closable by a user of the gun whereby closure of the latter orifice establishes a static pressure in the chamber to progressively collapse said tube and cause dispensing of material, and means for adjusting the force of said spring to vary the static pressure in said chamber.

3,871,554
EYE WASH STATION

Charles Mason Huck, Oldwick, N.J., assignor to Sybron Corporation, Rochester, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,370
Int. Cl. B65d *35/30*
U.S. Cl. 222—96 6 Claims

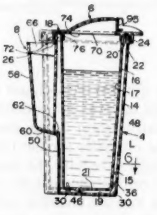


1. A self-contained eye wash station comprising:
a. a housing having an axial slot formed through the wall thereof;
b. a collapsible container confined in said housing, said container adapted to contain an eye wash liquid and having an open spout portion extending through said housing;
c. bias means between said housing and container, said means capable of exerting a force on said container to collapse the same for expressing the liquid contents thereof through said spout, said means including a flange extending through said slot; and
d. manually operable release means in releasable engagement with said flange restraining said bias means.

3,871,555
CONTAINER DEVICE FOR DISPENSING LIQUIDS

Delmas E. Collins, West Lafayette, Ohio, assignor to Jones-Zylon, Inc., West Lafayette, Ohio

Filed Mar. 17, 1972, Ser. No. 232,675
Int. Cl. A47g *19/12*
U.S. Cl. 222—131 4 Claims



1. A sanitary container for dispensing liquids therefrom comprising,
a hollow body,
said body being open at the top and closed at the bottom for receiving and discharging a liquid material,
a lid member is detachably connected to and covers the open top of said body,
said lid member includes a cover portion having a discharge opening therein,
said lid member includes an integrally formed spout assembly having another discharge opening connected in fluid communication with said discharge opening in said cover member for discharging liquid from said device,
said body is of a double shell construction including an inner shell and an outer shell,
said body includes centering means between said inner shell and said outer shell for supporting said shell in spaced generally continued relation with respect to one another to insulate said inner shell from the atmospheric environment surrounding said container,
said outer shell and said inner shell each includes a depression therein,
said depression of said inner shell is aligned with and spaced inwardly from depression of said outer shell to enable said inner shell to be fitted internally of said outer shell,
said depressions extend in the lengthwise direction of said shells,
said outer shell is formed with a handle for holding said body,
said handle extends along and in the lengthwise direction of said depression to enable said handle to be positioned closer to the center of mass of the liquid contained in said container,
said cover portion is of a generally planar construction and said spout assembly includes a lip member having a bottom wall which is formed integral with and extends outwardly from said cover portion, being disposed generally in the general plane thereof,
said lip member includes a front edge disposed outwardly of said outer shell and an inner edge disposed inwardly of said inner shell,
said spout assembly including an approach component connecting said discharge opening in said cover portion in fluid communication with said discharge opening in said spout assembly,
said approach component being raised out of the general plane of said cover portion in overlying relation with respect to the discharge opening in said cover portion directing fluids passing through said discharge opening in said cover portion through said discharge opening in said spout assembly onto said lip member for discharge from said device,
said approach component includes a top wall disposed above the general plane of said cover portion and overlying said opening in said cover portion,
said bottom wall of said lip member commences generally vertically below the termination of said top wall of said approach component for defining said discharge opening in said spout assembly,
said discharge opening in said spout assembly defines a plane which extends generally perpendicular to the general plane of said cover portion,
said approach component being further defined by spaced laterally extending side walls which extend outwardly from said cover portion and project beyond the periphery of said cover member to form part of said spout,
said side walls being disposed on opposite sides of said opening in said cover portion,
said top wall being supported on and extending between said side walls as to span and cover said opening in said cover portion, forming a passageway for directing liquid from said discharge openings in said cover portion and said spout assembly and along said bottom wall,
a shield member is disposed in covering relation over said discharge opening in said spout assembly to prevent contaminants from entering said container and
said shield member is pivotally connected to said approach component to enable pivotal movement by gravity between a closed position covering said discharge opening in said spout assembly and an open position upon movement of said container from an upright position to a tilted

position, respectively.

3,871,556
MACHINE FOR FILLING MOULDS OR CAVITIES WITH A FREE-FLOWING MIXTURE OF REACTION COMPONENTS

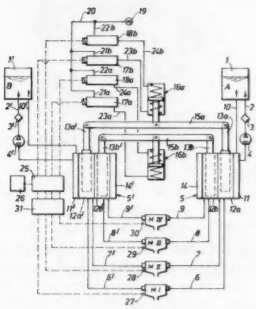
Karl Breer, both of Bergisch-Neukirchen, and Klaus Nadolski, both of Bergisch-Nuekirchen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 12, 1973, Ser. No. 331,460

Claims priority, application Germany, Feb. 26, 1972, 2209169

Int. Cl. B67d *5/60*

U.S. Cl. 222—132 **36 Claims**



1. A machine for filling moulds or cavities with a free flowing mixture of at least two components maintained separately in storage vessels therefor, the machine comprising:

a. a pair of mixing heads comprising a first and a second mixing head,

b. a pipeline switch for connection to each of the storage vessels and for successively delivering its component to the respective mixing heads,

c. each pipeline switch comprising an inlet for connection to its storage vessel, and a housing member including a cooperating slide, the housing member of each pipeline switch comprising an inlet communicating with the pipeline switch inlet, a first outlet having a pipeline connected to the first mixing head, a second outlet having a pipeline connected to the second mixing head, and a third outlet for receiving the component of the pipeline switch, the slide and housing of each pipeline switch having coordinated constructions so that by selected movement the slide in the housing, the inlet can be exclusively communicated with any one of said outlets,

d. and actuating means coupled with the pipeline switches for operation of the slides thereof for successively delivering the components simultaneously to each mixing head.

3,871,557
SPRAYING APPARATUS

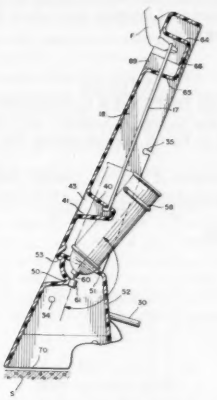
Thomas J. Smrt, 31 W. 300 West Bartlett Rd., Bartlett, Ill. 60103

Filed Aug. 2, 1973, Ser. No. 385,168

Int. Cl. B67d *5/64*

U.S. Cl. 222—162 **2 Claims**

1. A spraying apparatus comprising a valve-equipped aerosol can having contents to be sprayed and an elongated frame having a spraying end and a handle end, holding means on the frame pivotally mounting the can for pivotal movement between an actuated position and a non-actuated position, the holding means including arcuately extending bumper means receiving the can in the non-actuated position and having a pair of side walls, valve abutment means on the frame engaging the valve of the can, the valve being of the type which is opened by lateral movement of the valve relative to the can whereby pivoting movement of the can from the non-actuated position to the actuated position opens the valve, a cord mounted on the frame and extending arcuately around a portion of the periphery of the can between the side walls of the bumper means when the can is in the non-actuated position, the cord extending from the can through each of the side walls to the handle end of the frame, tensioning of the cord at the handle end causing straightening of the cord between the



side walls of the bumper means and causing pivoting of the can relative to the valve from the non-actuated position to the actuated position to open the valve, resilient return means mounted on the frame and engaging the can and urging the can into the non-actuated position, a casing portion surrounding the valve abutment means and providing a spraying chamber the casing portion extending adjacent the surface to be sprayed whereby the contents being sprayed are protected from the wind, and wheels mounted on the frame for supporting the casing portion adjacent the surface to be sprayed.

3,871,558
SEMI-AUTOMATIC DISTRIBUTOR OF DOSES OF VISCOUS PRODUCTS

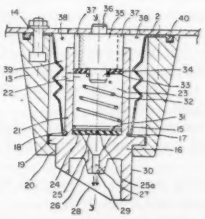
Maurice Paul Gournelle, demeurant 1 rue des Bruyeres 92, Asnieres, France

Filed Oct. 30, 1973, Ser. No. 411,040

Claims priority, application France, Oct. 31, 1972, 72.38618

Int. Cl. B67d *5/42*

U.S. Cl. 222—181 **15 Claims**



5. An apparatus for discharging doses of liquid comprising a receptacle containing the liquid to be distributed, at least one guide member attached to said receptacle and defining a passage for receiving said liquid from said receptacle, a dispensing member movably mounted on said guide member, said members defining a chamber for receiving said liquid

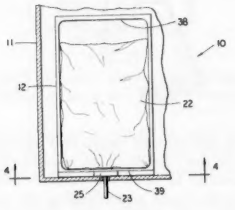
from said passage, means responsive to movement of said dispensing member in one direction relative to said guide member for pressurizing the fluid in said chamber and means responsive to said pressurizing of said fluid for defining an outlet opening through which said liquid discharges, said outlet opening closing upon movement of said dispensing member in a direction opposite said first direction, said dispensing member defining an outlet passage in communication with said outlet opening, the dimensions of the walls of said passage being selected to attract said liquid by capillary action after discharge from said opening and before discharge from said dispensing member.

3,871,559

MILK DISPENSER CONTAINER

Gary W. Smith, and George A. Lemcke, both of Indianapolis, Ind., assignors to Parish Manufacturing Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 334,684, Feb. 22, 1973, abandoned. This application Oct. 1, 1973, Ser. No. 402,459
Int. Cl. B67d *5/08*
U.S. Cl. 222—183 **1 Claim**



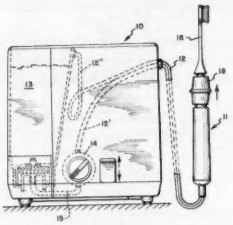
1. The combination of:
a liquid dispenser cabinet having an inner chamber with a bottom wall and a first aperture positioned thereon;
a container fitted within said dispenser cabinet and having a removably mounted front wall and a bottom slanted wall, said container including a second aperture from which said slanted wall extends upwardly;
said bottom slanted wall including a bridge integrally joined thereto which defines said second aperture;
said container having a pair of vertical sidewalls extending upwardly from said bottom slanted wall with each sidewall having an outwardly extending flange perpendicularly joined thereto;
said flanges becoming gradually narrower at the uppermost vertical end;
said removable wall comprising a sheet of transparent material with depending portions extending lengthwise on opposite sides of said sheet being molded onto said sheet and defining a pair of opposed C-shaped channels slidably receiving said flanges, said channels becoming gradually narrower at the uppermost vertical end securing said front wall to said container;
said container including a back wall parallel to said front wall and a top wall joined by means of molding to said back wall;
said sidewall being molded to said top wall, said slanted bottom wall and said back wall;
said removable front wall having a locking tab member molded thereto, said locking tab member being slidably received by said bridge;
said removable front wall having a wedge-shaped member molded thereto positioned such that when said removable front wall is in place said wedge-shaped member engages said top wall to prevent movement of said front wall; and
a flexible plastic bag of liquid fitted within said container atop said bottom slanted wall and including an outlet tube extending through said first aperture and said second aperture.

3,871,560

RESERVOIR FOR A LIQUID PUMP INCLUDING MEANS FOR INITIALLY FORCING LIQUID INTO THE PUMP

Jean-Pierre Crippa, Geneva, Switzerland, assignor to Les Produits Associes, SA, Geneva, Switzerland

Filed Aug. 1, 1973, Ser. No. 384,513
Int. Cl. G01f *11/30*
U.S. Cl. 222—325 **6 Claims**

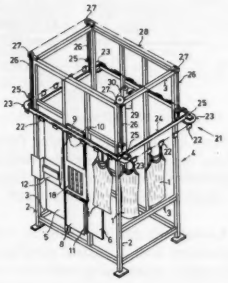


1. Apparatus for supplying liquid to a pump which comprises
a. a pump inlet fixture for supplying liquid to said pump,
b. a removable reservoir for supplying liquid to said pump inlet fixture when placed in position thereon,
c. said reservoir including a chamber at the bottom thereof having an inlet from the portion of the reservoir thereabove and an outlet,
d. a closure member vertically movable in said chamber between upper and lower positions with respect to the chamber and having vertically spaced inlet and outlet closure sections,
e. said outlet closure section being constructed and adapted to close said outlet of the chamber in the lower position of the closure member,
f. said inlet closure section and said inlet to the chamber being constructed and adapted to close the inlet through a range of intermediate positions of the closure member and open the inlet in upper and lower positions of the closure member,
g. means for resiliently biasing said closure member toward the lower position thereof,
h. said outlet and said pump inlet fixture being designed and adapted for substantial movement of the fixture into said chamber as the reservoir is placed in position on the fixture,
i. sealing means for maintaining a water-tight relationship between said outlet and pump inlet fixture as the reservoir is placed in position on the fixture,
j. and means for moving said closure member from lower to upper positions thereof with respect to the chamber as the reservoir is placed in position on said fixture,
k. whereby liquid from said chamber is forced into said pump inlet fixture in said range of intermediate positions of the closure member as the reservoir is placed in position on the fixture.

3,871,561
UPRIGHT FOLDING APPARATUS FOR CLOTHING ARTICLES

Conrad Arbter, Mittelweg 1 1/10, D8741 Saal an der Saale, Germany

Filed May 15, 1974, Ser. No. 470,199
Claims priority, application Germany, June 15, 1973, 2330400
Int. Cl. A41h *33/00*
U.S. Cl. 223—37 18 Claims



1. A folding apparatus for textile goods comprising an upright frame means, a pair of longitudinal side fold blade means for movement in a vertical plane within said frame means towards each other, a longitudinal folding plate means comprising a pair of folding plate members adapted for movement towards each other, a pair of transverse fold blade means adapted for movement in a vertical plane and forming a rest surface for said folding plate members in a predetermined position, said transverse folding blade means each comprising a front edge wherein the respective front edges of the transverse blade means are facing each other, a counter support means adapted for movement transversely and located between said front edges of said transverse fold blade means, a transverse folding plate means cooperating with said transverse fold blade means and adapted for movement in a plane parallel with the plane of the said longitudinal side fold blade means.

3,871,562
INFANT CARRIER

George D. Grenier, 337 Main Street, Morro Bay, Calif. 93442

Filed Jan. 23, 1974, Ser. No. 435,979
Int. Cl. A47d *13/02*
U.S. Cl. 224—6 3 Claims

1. An infant carrier adapted to be attached to the torso of another comprising:

a flexible seat section conformed to be straddled by the infant;

a pair of flexible shoulder straps attached at the respective one ends thereof to one edge of said seat section and conformed in length to a dimension surrounding on a diagonal the torso of said another;

a pair of flexible attaching straps attached at respective one ends thereof proximate an opposed edge of said seat section;

means for selective connection of the other end of said shoulder straps with said attaching straps respectively connected to the other ends thereof;

said seat section includes a first and second flexible layer conformed in planform to a common rectangular shape having the longitudinal edges thereof disposed between said one and opposed edges, said flexible layers having received therebetween the respective one ends of said shoulder and attaching straps secured in such receiving relationship by peripheral stitching along the edges of said seat section;

said shoulder and attaching straps are received within said seat section at angles relative to the longitudinal edges of said section and said shoulder and attaching straps extend within the interior of said seat section to respective coincident geometric alignment, being secured in such position by common stitching with said first and second flexible layers;

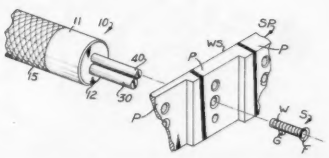
said seat section includes a flexible pocket layer disposed in overlaying alignment over the segment of said section receiving the secured ends of said attaching straps;

said attaching straps are dimensionally conformed to align for securing with the distal ends of said shoulder straps between said shoulder straps and the torso of said another having said seat section hung therebetween.

3,871,563
BREAK-OFF TOOL

John O. King, Jr., 3990 N. Ivy Rd., Atlanta, Ga. 30342

Continuation-in-part of Ser. No. 274,613, July 24, 1972, which is a continuation-in-part of Ser. No. 882,126, Dec. 4, 1969, Pat. No. 3,679,109, which is a continuation-in-part of Ser. No. 711,386, March 7, 1968, abandoned. This application July 12, 1973, Ser. No. 378,445
Int. Cl. B26f *3/00*
U.S. Cl. 225—103 5 Claims



1. Apparatus for severing thin walled sleeves having at least one circumferentially extending narrow weakened portion therearound including:

an internal support member slidably receivable into the sleeve from one end thereof having an external configuration conforming to the internal configuration of the sleeve, said internal support member defining an operating end surface on the protruding end thereof oriented substantially normal to the central axis of said internal support member;

a support body carrying said internal support member;

positioning means carried by said support body and laterally spaced from said internal support member for selectively locating said internal support member within said sleeves, said positioning means including:

a spacer member carried by said support body having a central axis oriented substantially parallel to the central axis of said internal support member, laterally spaced from said internal support member sufficiently for the side wall of the sleeve to be slidably received therebetween, and defining an abuttment on the protruding end thereof, and

adjustment means for releasably locating said abuttment with said operating end surface of said internal support member; and,

a removal member carried by said support body and protruding therefrom, said removal member comprising a first section conforming in diameter and shape to the outside of the sleeve and a reduced diameter section integral with the protruding end of said first section and located coaxially therewith, said reduced diameter section having an outside diameter conforming to the diameter and shape of the inside of the sleeve, and an abuttment formed between said first section and said reduced diameter section so that when said reduced diameter section lies within the sleeve, said abuttment will engage the end of the sleeve to move the sleeve.

3,871,564

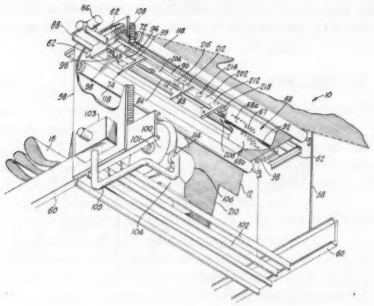
METHOD AND APPARATUS FOR GUIDING AND TENSIONING A WEB DURING CHANGEOVER FROM A WEB OF ONE WIDTH TO A WEB OF ANOTHER WIDTH

David Middleman, Baltimore, Md., assignor to Kappers Company Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 236,067, March 20, 1972, Pat. No. 3,788,515. This application Jan. 11, 1974, Ser. No. 432,454

Int. Cl. B65h *17/44*

U.S. Cl. 226—1 **8 Claims**



5. A method of applying tension to an advancing web during changeover from a web of one width to a web of another with comprising the steps of:

advancing said web of one width along a path of advance;

applying subatmospheric pressure to said web of one width substantially across its entire width to cause tension therein;

applying said subatmospheric pressure to a central portion of said web of one width and discontinuing the application of subatmospheric pressure to adjacent lateral portions thereof prior to changing the width of said web, the width of said centermost portion being substantially equal to or narrower than the narrowest web to be advanced; and thereafter

applying subatmospheric pressure substantially across the entire width of said web of another width then being advanced.

3,871,565

CARTRIDGE-FIRED APPARATUS FOR DRIVING FASTENERS AND THE LIKE

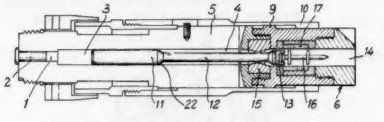
Pierre Termet, 16 Impasse Belloeuf, Lyon 3, France

Filed Feb. 22, 1973, Ser. No. 334,943

Claims priority, application France, Feb. 23, 1972, 72.06100

Int. Cl. B25c *1/14*

U.S. Cl. 227—10 **6 Claims**



1. Cartridge fired apparatus for driving fasteners and the like, said apparatus comprising a housing defining

a cartridge chamber for receiving a cartridge, and

an explosion chamber communicating with said cartridge chamber,

a piston-ram having one end part slidably mounted in said explosion chamber and a central part having a smaller section than either of its end parts,

a stop-defining ring encircling said central part at the end of said explosion chamber remote from said cartridge chamber, and fixed to a guiding tip encircling the other end part of said piston-ram on the side of said ring remote from said explosion chamber, said ring defining an orifice having a section at least equal to, but at most slightly larger than that of the central part of the piston-ram, and smaller than the section of either of said end parts,

and means retaining said housing and guiding tip in axial alignment with each other,

said one end part of said piston-ram defining a shoulder which abuts said ring after an explosion to prevent expulsion of said piston-ram through said guide member, while the other end part of said piston-ram defines a shoulder positioned to abut said ring when said apparatus is in firing position, before explosion of a cartridge.

3,871,566

FASTENER DRIVER TOOLS

Wolfgang Elliesen, Ahrensburg, and Hellmuth Fehrs, Hamburg, both of Germany, assignors to Joh. Friedrich Behrens, Ahrensburg, Germany

Filed July 2, 1973, Ser. No. 375,700

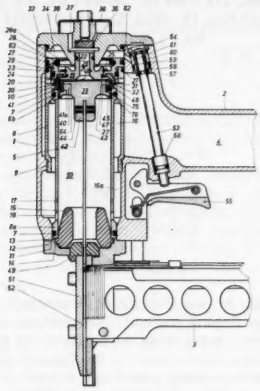
Claims priority, application Germany, July 25, 1972, 2236352

Int. Cl. B25c *1/04*

U.S. Cl. 227—130 **3 Claims**

1. In a compressed air operated driving tool for fasteners comprising, in combination, a casing having a cylindrical working cylinder, an operating piston reciprocal within said working cylinder movable between a normal retracted position and an extended working position, a control piston within said casing concentrically related to said working cylinder and located adjacent said operating piston when said piston is in said retracted position and having oppositely disposed first and second pressure faces of unequal area, a reservoir in said casing connected to a compressed air supply, a passage in said casing establishing communication between said reservoir and said control piston first face, a control valve on said casing selectively venting said control piston second face to the atmosphere, sealing means on said control piston sealing said working cylinder from said reservoir when said operating piston is in the retracted position, an annular holding surface on said operating piston, and an annular resilient sealing lip on said control piston concentric with said holding surface frictionally engaging said holding surface to maintain said operating piston in the retracted position, actuation of said control

valve displacing said control piston axially from said operating piston releasing said operating piston and exposing said operating piston to said compressed air supply in said reservoir whereby said operating piston is moved to said extended position.

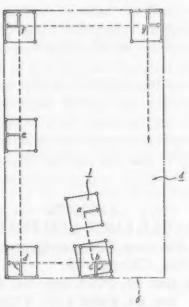


3,871,567

APPARATUS FOR TRAVERSING A WORKPIECE WITH A WORKING HEAD

Michiyasu Ishida, Nagaokakyo, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1974, Ser. No. 431,720
Claims priority, application Japan, Jan. 8, 1973, 48-5342
Int. Cl. B23k *37/02*
U.S. Cl. 228—32 **7 Claims**



1. Apparatus for applying work to a workpiece which has at least two upstanding walls which meet one another at an inside corner, comprising:

a travelling truck having support means which permit the truck to be supported for lateral relative movement along beside the walls;

a working head for performing a task with respect to the walls;

means mounting the working head on the travelling truck for projection and retraction of the working head with respect to the travelling truck;

turret means mounted on the travelling truck for relative rotation of the truck with respect to the turret about an axis generally vertical relative to the travelling truck;

at least three wall engaging means on the turret means, disposed in a pattern complementing the angularity of the walls with respect to one another, so that the truck may travel along one of the walls with a first and a second of the wall engaging means in moving contact therewith, until, as the inside corner is reached, the second of these two wall engaging means additionally contacts the other of the walls which meets at the corner, and the third of the wall engaging means contacts said other wall, and so that as the truck travels away from the corner along said other wall, the first and second of the wall engaging means are parted from said one wall and the second and third of the wall engaging means remain in contact with said other wall;

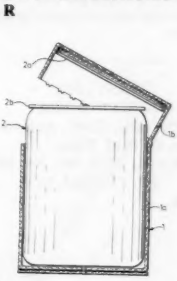
mutually engaging cam and follower means mounted on the turret and working head, respectively, the cam being profiled to urge projection and retraction of the working head with respect to the travelling truck, when the three wall engaging means are in contact with said walls, according to a pattern which preserves the juxtaposition of the working head and the respective one of the walls toward and past the corner as the travelling truck is rotated, about said axis relative to the turret, through an angle matching the angle included between the two walls.

3,871,568

CARTON

Peter Bahler, Seltisberg, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Sept. 6, 1973, Ser. No. 394,702
Claims priority, application Switzerland, Sept. 13, 1972, 13453/72
Int. Cl. B65d *5/40, 25/00*
U.S. Cl. 229—14 R **3 Claims**



1. A carton comprising an outer cardboard box having an inner plastics container fitting snugly inside said cardboard box, said cardboard box having a swing lid comprising a side wall and a top of overlapping flaps connected to said side wall, said container having a snap fitting lid with two projecting therefrom, said tabs being clamped between said overlapping flaps thereby coupling said snap fitting lid to said swing lid to remove the former from said container when the swing lid is moved to open the box and to seal the box.

3,871,569

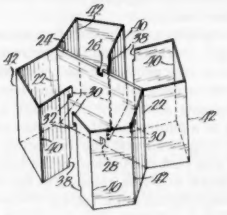
DIVIDER FOR A CONTAINER

Paul B. Wharton, Jr., Deerfield, Ill., assignor to Kinetics Container Corporation, Des Plaines, Ill.

Filed June 7, 1973, Ser. No. 367,776
Int. Cl. B65d *3/00*
U.S. Cl. 229—15 **7 Claims**

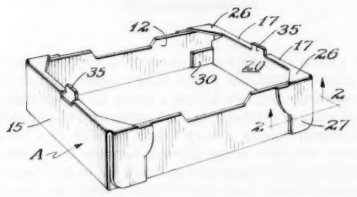
1. A blank for forming a divider in a container comprising: an elongated, generally rectangular sheet of flexible material, said sheet including a central section intermediate its ends, said central section including a line of weakening extending in the direction of elongation of said sheet and located along substantially the midpoint of said sheet, first and second end sections joined to said central section at opposite sides thereof, each of said end sections being divided into two

portions by a slit extending from the associated end of said sheet inwardly to said central section, said slits meeting said line of weakening at respective ends thereof, said central section further including at least three notches, two of said notches being located in the side edges of said sheet in said central section and extending inwardly thereinto, the third of said notches straddling said line of weakening, each portion of each of said end sections including a hook formation directed



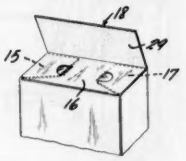
outwardly from the associated end of said sheet, one of the hooked portions of each end section being located on one portion thereof adjacent the junction of an edge of said sheet and an end of said sheet, the other hooked portion of each end section being located on the other portion adjacent the junction of the end of said sheet and said slit, and a plurality of recesses, one for each hooked portion located on the associated portion of each end section opposite from the location of said hooked portion.

3,871,570
SHIPPING TRAY
Ivan E. Garmon, Placentia, Calif., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.
Filed Apr. 2, 1973, Ser. No. 347,068
Int. Cl. B65d *5/24*
U.S. Cl. 229—31 R **8 Claims**



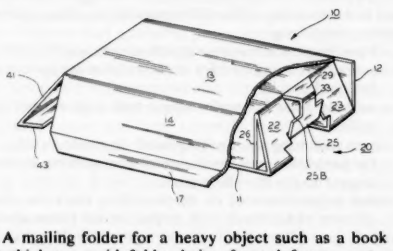
1. A tray including:
a rectangular bottom panel,
side panels foldably connected to opposite sides of said bottom panel,
end panels foldably secured to opposite ends of said bottom panel,
top flanges hingedly connected to said end panels,
end wall liner panels foldably connected to said top flanges,
corner flaps hingedly connected to opposite sides of said top flanges,
locking tongues hingedly connected to said corner flaps,
said side walls including slots through which said locking tongues extend,
said end wall liner panels having locking lugs thereon, and said bottom panel having apertures therein in which said locking lugs are engageable.

3,871,571
CARTON, CARTON BLANK AND METHOD OF ASSEMBLING THE CARTON
William J. Cupo, 216 York St., Jersey City, N.J. 07302
Filed Oct. 16, 1972, Ser. No. 297,921
Int. Cl. B65d *5/10*
U.S. Cl. 229—39 R **4 Claims**



1. In a carton having four serially connected rectangular panels and four flaps at one end of the carton with each flap being hinged to a panel along the length of the panel end, a first of said flaps being joined to the first of said panels, a second of said flaps being joined to a second of said panels spaced from said first flap by third and fourth flaps which are joined to third and fourth panels, respectively, said first and second flaps being bent inwardly perpendicular to their respective panels to form inner flaps for the carton end, said third flap lying generally over both the first and second flaps perpendicular to its respective panel and glued to said first and second flaps, and said fourth flap overlying at least a portion of said said third flap to form an outer flap for the carton and perpendicular to its respective panel and being glued to said third flap, wherein the improvement comprises said first and second flaps having a side lying adjacent the hinge line of the third flap and the third panel which tapers generally upwardly and inwardly from said third flap when the first, second and third flaps are in a position which is substantially coplanar with their respective panels, and tab means cut in the surface of the third flap which underlie and hold a portion of said first and second flaps, said tab means comprising two spaced tabs joined to the panel by respective hinge lines which are substantially perpendicular to the hinge lines of said third panel, said tab means underlying that portion of the first and second flaps lying adjacent the edge of the flap which is opposite the hinge line of the first and second flaps with their respective panels, said first and second flaps substantially completely overlying said respective tabs, and said first and second flaps not extending above the top surface of said third flap.

3,871,572
ANGLE LOCK END FOLDER
Boyd T. Skaggs, Ravenna, Ohio, assignor to Container Corporation of America, Chicago, Ill.
Filed Jan. 21, 1974, Ser. No. 434,883
Int. Cl. B65d *5/02, 85/30*
U.S. Cl. 229—40 **1 Claim**



1. A mailing folder for a heavy object such as a book of great thickness, said folder being formed from a cut and scored blank of paper board or the like and folded into posi-

tion so as to provide opposed and braced end protective cells for opposite ends of said book, said folder comprising:

a. rectangularly shaped main, first side, top and opposite side panel connected along fold lines and folded to define a tube;

b. protective cell forming elements extending from opposed ends of said main panel foldably connected to each other and to said main panel and foldable to position to enclose opposite ends of said book, said elements each comprising:

i. first and second spaced flanking flap elements foldably connected to said main panel and foldable to an inclined upright position;

ii. an inner flap element foldably connected to said flanking flap and foldable to a vertical position with the distal edge thereof bearing against said main panel;

iii. a central reinforcing element extending between said first and second flanking elements and foldably connected at its ends to said main panel and said inner panel;

iv. said central reinforcing element comprising first and second portions additionally defined by spaced edges in said first and second flanking flap elements and in said main panel;

v. said central reinforcing element being folded upon folding of said first and second flanking flap elements to an inclined position.

c. closure elements extending from said top panel and foldable to a position over said protective cell forming elements to provide a pair of opposed protective cells.

3,871,573

PROCESS AND AGENTS FOR OPENING PAPER CONSTRUCTIONS

Nelson Whitman, Lincoln, Mass., assignor to Thor Dahl, Inc., New York, N.Y.

Division of Ser. No. 28,051, April 13, 1970, Pat. No. 3,677,460. This application June 16, 1972, Ser. No. 263,647. The portion of the term of this patent subsequent to July 18, 1989, has been disclaimed.

Int. Cl. B43m *7/00*

U.S. Cl. 229—85 **4 Claims**

1. In a paper envelope of the type having opposed sheets folded relative to each other and connected together at a plurality of edges the improvement of which comprises at least a portion of the envelope adjacent at least one of said edges being impregnated with a chemical sensitizing agent consisting essentially of a higher molecular weight alkyl sodium sulfate, whereby treatment of at least one of said edges with a chemical developing agent subjects the paper of said edge to a controlled chemical degradation to affect the separation of the opposed sheets along said edge.

3,871,574

METHOD AND APPARATUS FOR CONCENTRATING THERMO-LABILE FLUIDS

Victor Grifols Lucas, Barcelona, Spain, assignor to Laboratories Grifols S/A, Barcelona, Spain

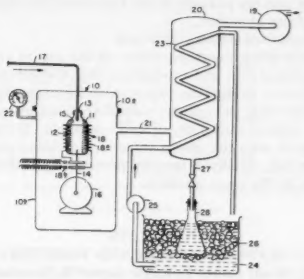
Filed July 5, 1973, Ser. No. 376,726

Claims priority, application Spain, July 6, 1972, 404902

Int. Cl. B04b *5/10, 15/02*

U.S. Cl. 233—11 **7 Claims**

1. A method for concentrating a thermo-labile liquid having a volatile component, comprising the steps of confining said liquid in a container to provide a substantial liquid-gas interface, centrifuging said liquid by rotating said container about its own axis while simultaneously reducing the gas pressure within said container to cause rapid volatilization of said volatile component at a temperature below the denaturization temperature of said liquid, said centrifuging step being performed at a speed sufficient to substantially eliminate foaming of said liquid, and continuing said simultaneous centrifugation



and pressure reduction steps until the concentration of said liquid has been increased a predetermined extent.

3,871,575

CENTRIFUGAL SEPARATOR HAVING VALVE IN PASSAGEWAY BENEATH DISTRIBUTOR FOOT

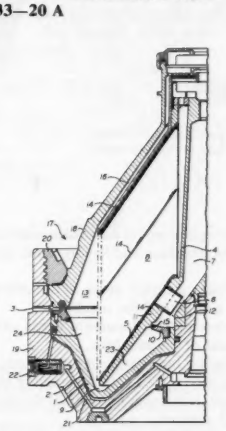
Heinrich Niemeyer, Oelde, Germany, assignor to Westfalia Separator AG, Oelde-1 Westfalen, Germany

Filed Mar. 15, 1974, Ser. No. 452,243

Claims priority, application Germany, Mar. 20, 1973, 2313669

Int. Cl. B04b *11/06*

U.S. Cl. 233—20 A **5 Claims**



1. In a centrifugal separator comprising:

a. a rotatably mounted drum having an upper end member and a lower end member enclosing a drum chamber for the separation, and having at least one discharge passageway disposed at the radially outward periphery of the drum,

b. a piston valve disposed within the drum defining one side of the drum chamber and movable vertically to open and close the discharge passageway(s),

c. a distributor coaxial within the drum for receiving feed to the separator and conveying the feed along the axis of the separator, the distributor having a distributor foot extending radially outwardly from adjacent the drum axis and over at least a portion of the piston valve and terminating at the radially outwardly disposed end thereof in spaced relation with the piston valve so as to define an annular gap between the piston valve and distributor foot commu-

nicating the radially extending passageway with the drum chamber,

d. at least one opening in the distributor foot adjacent the drum axis for passage of the feed from the distributor to the drum chamber,

the improvement which comprises:

e. a valve plate mounted either on the piston valve or the distributor foot and extending either toward the distributor foot or toward the piston valve for engagement therewith to close the radially extending passageway at a location radially outwardly of said opening(s) in the distributor foot, with the piston valve in the closed position and open the radially extending passageway with the piston valve in the open position.

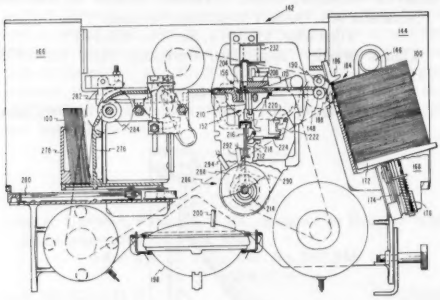
3,871,576
DATA RECORDER AND VERIFIER

Donald E. Bean; James T. Engh; James R. Hammer; John J. Igel, all of Rochester; Myron D. Schettl, Oronoco; Harry J. Tashjian; Richard J. Ullmer, both of Rochester, and John W. Kerr, Byron, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 845,817, July 29, 1969, Pat. No. 3,642,197. This application Jan. 28, 1971, Ser. No. 110,584

Int. Cl. G06k *13/10, 13/12*

U.S. Cl. 234—35 **1 Claim**



1. A machine for operating on document cards and adapted to rest on a horizontal surface and having front, back and ends and comprising,

a hopper for holding a supply stack of document cards and positioned at one end of the machine,

a stacker for receiving the document cards and positioned at the other end of the machine,

a flat deck extending between said hopper and stacker,

means including driven feed rolls for moving the document cards along said deck longitudinally of the deck from said hopper to said stacker,

an encoding means positioned at said deck for encoding information on document cards moving along the deck, reading means positioned at said deck and between said encoding means and said stacker for reading encoded information on document cards moving along the deck, printing means positioned at said deck between said reading means and said stacker for printing information on document cards moving along the deck,

said deck being horizontal in its longitudinal direction when the machine rests on said horizontal surface,

said hopper extending below the level of said deck and being inclined at an acute angle with respect to the plane of said deck so that the document cards are fed downwardly from the hopper at this acute angle on to the deck, said stacker extending in substantially the same direction as said deck,

a pick roll for feeding document cards off the top of the stack of document cards in said hopper and on to said deck for subsequent transport on the deck to said encoding means and said reading means and said printing means and ultimately to said stacker, and

means for turning the document cards through right angles as they leave said deck and enter said stacker so that the cards are individually substantially vertically disposed in said stacker and form a stack extending in the same direction as said deck,

said deck being inclined at an acute angle with respect to horizontal from the front to the back of the machine and said hopper and said stacker thus having their sides declining at acute angles with respect to horizontal when the machine rests on said horizontal surface.

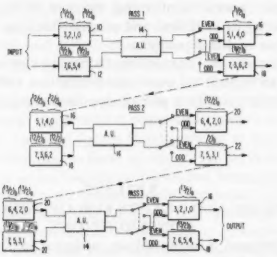
3,871,577
METHOD AND APPARATUS FOR ADDRESSING FFT PROCESSOR

Karl B. Avellar, Ellicott City, and James A. Ross, Aberdeen, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 13, 1973, Ser. No. 424,532

Int. Cl. G06f *7/38, 15/34*

U.S. Cl. 235—156 **9 Claims**



4. An FFT processor having calculated complex data points stored and retrieved in an in-place operation, comprising in combination:

an FFT arithmetic unit operable in accordance with an externally applied selected trigonometric coefficient to accept consecutive pairs of complex data points simultaneously inputted thereto in a dual data stream and provide consecutive pairs of intermediate output data points (Fourier coefficients) simultaneously in a dual data stream in successive iterations according to a predetermined FFT algorithm;

input means coupled to said FFT arithmetic unit for supplying consecutive pairs of complex data points as an initial input thereto;

first digital memory means having even and odd numbered memory locations selectively coupled to the output of said FFT arithmetic unit during first alternate iteration periods and including selectively controlled address means for selectively storing simultaneous pairs of intermediate output data points consecutively calculated and being operable during the first half of each of said first alternate iteration periods to consecutively address and store the first half of the data points appearing in one data stream of said dual data stream in a first plurality of even numbered memory locations and to consecutively address and store the first half of the mutually corresponding data points appearing in the other data stream of said dual data stream in a first plurality of odd numbered memory locations, and first means operable at the end of the first half of the respective iteration period to switch the data flow into said memory means from said FFT arithmetic unit and consecutively address and store the second half of the data points appearing in said one data stream in a second plurality of even numbered memory locations and to consecutively address and store the

second half of the data points appearing in said other data stream in a second plurality of odd numbered memory locations, said means being operable at the end of the respective iteration period to switch the data flow back to its original state at the beginning of the next iteration period;

first selectively controlled read-out means coupling said first digital memory means to the input of said arithmetic unit during the immediately succeeding iteration period following each first alternate iteration period and consecutively supplying the pairs of complex data as stored to the FFT arithmetic unit as another input dual data stream;

second digital memory means, having even and odd numbered memory locations selectively coupled to the output of said FFT arithmetic unit during second alternate iteration periods relative to said first alternate iteration periods and including selectively controlled address means for selectively storing simultaneous pairs of intermediate output data points consecutively calculated and being operable during the first half of each of said second alternate iteration periods to consecutively address and store the first half of the data points appearing in said one data stream of said dual data stream in a first plurality of even numbered memory locations and to consecutively address and store the first half of the data points appearing in the other data stream in a first plurality of odd numbered memory locations, and second means operable at the end of the first half of the respective iteration period to switch the data flow into said second memory means from said FFT arithmetic unit and consecutively address and store the second half of the data points appearing in said one data stream in a second plurality of even numbered memory locations and to consecutively address and store the second half of the data points appearing in said other data stream in a second plurality of consecutive odd numbered memory locations, said second means being operable at the end of the respective iteration period to switch the data flow back to its original state at the beginning of the next iteration period;

second selectively controlled read-out means coupling said second digital memory means to the input of said FFT arithmetic unit during the immediately succeeding iteration period following each second alternate iteration period and consecutively supplying the pairs of complex data as stored to the FFT unit as still another input dual data stream;

dual data stream output means selectively coupled to one of said first and second read-out means for providing an output dual data stream as consecutive pairs of complex data as stored after the final iteration period, having a data sequence identical to the sequence of the original input data stream.

3,871,578

DATA PROCESSING SYSTEM FOR MULTIPLYING AND INTERGERIZING FLOATING POINT NUMBERS

Adrianus J. Van De Goor, Wilnes, Netherlands, and Leonard B. Hughes, Stow, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 10, 1972, Ser. No. 296,028
Int. Cl. G06f *7/52*
U.S. Cl. 235—164 **6 Claims**

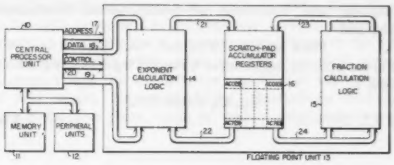
1. A system for multiplying two floating-point numbers each having the same precision and each comprising a mantissa and an exponent, said system comprising:

A. mantissa calculation means including means for multiplying the mantissas of the two numbers,

B. means for storing the product from said multiplying means with a precision greater than the precision of either mantissa being multiplied,

C. means for adding the exponents,

D. means for storing the output from said exponent addition means, and



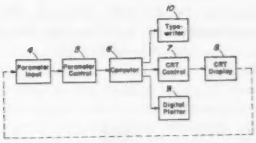
E. means responsive to the contents of said product storage and the exponent storage means for converting the contents of the product storage means into separate integer and fraction values.

3,871,579

APPARATUS FOR DISPLAYING ISODOSE CURVES OF RADIATION WITH PROGRAM FOR DIGITAL COMPUTER COUPLED THERETO DETERMINED IN RELATION TO SOURCE OF RADIATION

Kiyonari Inamura, c/0 Nippon Electric Co. Limited, 7-15, Shiba Gochome, Tokyo, Japan

Continuation-in-part of Ser. Nos. 157,587, June 28, 1971, abandoned, Ser. No. 877,832, Nov. 18, 1969, abandoned. This application Feb. 2, 1973, Ser. No. 329,192
Claims priority, application Japan, Nov. 20, 1968, 43-84469
Int. Cl. G06f *15/42*
U.S. Cl. 235—198 **10 Claims**



1. Apparatus for displaying a predetermined number of isodose curves representative of respective doses of radiation to be absorbed by an object within an area of a coordinate plane preselected in said object, and for selecting a particular plurality of said parameters for operating a selected radiation source placed at least at one preselected spacial relation relative to said object, said apparatus comprising:

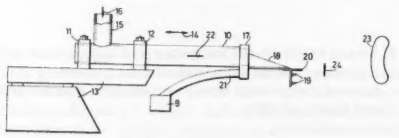
an input device adapted to be set in compliance with a combination of values of such operating parameters and to generate second digital signals representative thereof, an electronic digital computer coupled to the output of said input device and operable in compliance with input signals and a program associated with a preselected radiation source to produce output signals, said output signals being representative of the coordinates of a plurality of quantized points at which said doses are to be absorbed by said object, and said input signals including said second digital signals and first digital signals representative of parameters for calculations including a step size for quantizing the points on said coordinate plane; and

a display output device operatively coupled to said computer and responsive to said output signals for visually displaying said isodose curves,

3,871,580
ELECTROSTATIC SPRAYING

Morris James Legge, Farnham; John Alastair Phipps, Farncombe, and Roger Patrick Corbett, Southampton, all of England, assignors to Plastic Coatings Limited, Surrey, England and University of Southampton, Southampton, England

Filed Aug. 8, 1973, Ser. No. 386,618
Claims priority, application United Kingdom, Aug. 10, 1972, 37306/72
Int. Cl. B05b *5/02*
U.S. Cl. 239—3 **7 Claims**

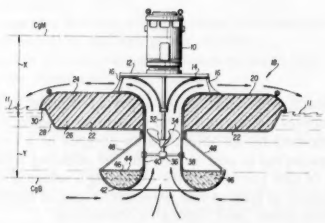


1. An apparatus for airless electrostatic powder spraying comprising a corona discharge device, a vibratory dielectric hollow elongate means for conveying powder to the corona discharge device, the elongate means having an open end for delivering powder to the corona discharge device and an inlet for receiving powder adjacent its opposite end, means for vibrating the elongate means such that powder fed to the elongate means is caused to flow therealong to the corona discharge device, and a vibratable member for dispersing the powder in a cloud in the vicinity of the corona discharge device.

3,871,581
AERATING APPARATUS HAVING BALLAST MEANS THEREFOR

Robert C. Dively, Richmond, Va., assignor to Environmental Products Inc., Richmond, Va.

Continuation of Ser. No. 179,871, Sept. 13, 1971, abandoned.
This application Feb. 6, 1974, Ser. No. 440,058
Int. Cl. E03b *9/20*
U.S. Cl. 239—16 **8 Claims**

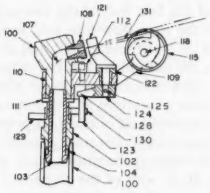


1. An aerating apparatus comprising:
a. flotation means for supporting said aerating apparatus in a body of water,
b. said aerating apparatus including
1. a motor mounted above said liquid,
2. a propeller driven by said motor with said propeller being immersed in said water in order to lift some of said water to be aerated,
3. and deflector means between said motor and said propeller for deflecting water lifted by said propeller substantially radially of said aerating apparatus,
c. a skirt member surrounding said propeller and extending a substantial distance beneath said flotation means,
1. said skirt member terminating in an outwardly flaring bottom portion which defines a substantially semicircular concave-upwardly, toroidal, ballast receiving means,
i. said outwardly flaring skirt member establishing a substantially low loss fluid flow into said propeller and toward said deflector means,
d. and separately added ballast means received in said substantially semicircular concave-upwardly, toroidal, ballast receiving means a substantial distance beneath said flotation means,
1. said motor having a center of gravity located a given distance above the surface of the water and said ballast means having a center of gravity sufficiently far below the surface of the water to establish an effective center of gravity for the entire aerating apparatus without the use of stabilizing discs below the floating line of said flotation means.

3,871,582
RAIN WHEEL

Milburn Emmett Biddle, 19115 Hartland St., Reseda, Calif. 91335

Filed Sept. 24, 1973, Ser. No. 400,230
Int. Cl. B05b *3/08*
U.S. Cl. 239—233 **3 Claims**



1. A rotary sprinkler head of the character described consisting of a sprinkler head with an inlet port threaded to accomodate a sleeve, said sprinkler head provided with a fluid fluid passage from said inlet port to a nozzle attached to an outlet port, a support fitting with inlet arranged to be connected to a source of liquid under pressure, said support fitting rotatably receiving said sleeve, a washer type combination seal and thrust bearing, two selector tabs angularly adjustable relative to each other and to the support fitting, wherein the improvement comprises a turbine wheel rotating on a horizontal axis and in a vertical plane containing the axis of rotation of said sprinkler head, said turbine wheel provided with a right hand set of turbine blades and a left hand set of turbine wheel blades, said turbine wheel being rotatable on a axle which is located eccentrically relative to said turbine wheel's geometrical center or center of mass, said axle being rotatably journalled in a cradle, means to support said cradle and position said turbine wheel relative to the said liquid jet stream flowing from said nozzle, said sprinkler head housing rotatably receiving said cradle, said cradle's angular rotation relative to said sprinkler head housing being limited by a mechanical means designed to allow said cradle to swing in one of the limiting conditions of rotation so that the jet stream impingement is directed properly to the said right hand set of turbine blades and in the other limiting condition of rotation the said jet stream impingement is directed properly to the said left hand set of turbine blades of said turbine wheel, a shuttle journalled in a bushing which is secured to or is an integral part of said cradle, a selector arm angularly oriented and secured to said shuttle by a means whereby said selector arm and said shuttle booth rotate together as an integral assembly, said cradle being provided with two mechanical stops designed to limit the angular rotation of said selector arm and said shuttle

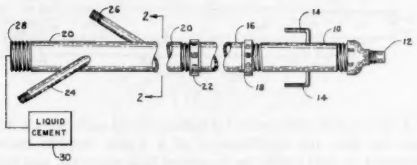
relative to said cradle and said liquid jet stream and said turbine wheel blades.

3,871,583

CEMENT SPRAY GUN WITH REMOTE AIR INJECTION

Paul H. Kellert, R.R. 1, Mannford, Okla. 74044

Filed Dec. 29, 1969, Ser. No. 888,620
Int. Cl. B05b *7/26*
U.S. Cl. 239—302 **2 Claims**



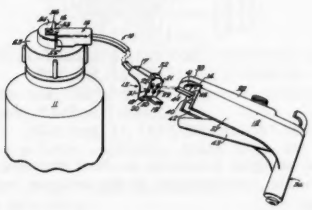
1. Apparatus for conveying liquid cement through a conduit from a supply of liquid cement to a discharge nozzle comprising a substantially cylindrical gun having an inlet end and a discharge end, said gun having a nozzle at the discharge end thereof; a cylindrical flexible hose having an inlet end and a discharge end, the discharge end of said hose being connected to the inlet end of said gun; a source of supply of liquid cement; a cylindrical and metallic air injection chamber having one end connected to the inlet end of said hose and having an opposite end connected to said source of supply of liquid cement, said air injection chamber having substantially the same internal diameter as said hose; and an air injection pipe connected at a forwardly directed angle to said air injection chamber for introducing air under pressure into said chamber at a forwardly directed angle, said air injection pipe being also connected tangentially with respect to said chamber so as to introduce said air tangentially with respect to the cross sectional are of said chamber.

3,871,584

DISCONNECTABLE SUPPLY CONDUIT FOR HAIR SPRAY SYSTEMS

William Wagner, Miami Beach, Fla., assignor to Watsco, Inc.

Filed June 17, 1974, Ser. No. 479,670
Int. Cl. B05b *7/32*
U.S. Cl. 239—307 **8 Claims**



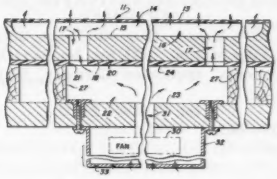
1. In a disconnectable supply conduit for hair spray systems including a fluid and pressurized air supply receptacle, a spray gun, and a flexible supply conduit communicating between the fluid and pressurized air supply receptacle, and the spray gun, the spray gun and the supply receptacle each having a pair of outwardly-projecting, side-by-side connector prongs and mechanism for interhookingly connecting with a connector member, the improvement comprising, a pair of flexible side-by-side conduit members, a molded connector body member at each end of said conduit members, a pair of side-by-side cylindrical through openings in each of said molded connector body members, a tubular receptacle member in one each of said connector body member through openings and communicating at one end with an end portion of one each of the ends of said pair of flexible side-by-side conduit members, and means for swivelingly supporting opposite end portions of each of said tubular receptacle members within their respective through openings, said connector body members each comprising yieldable hook means cooperative with the interhooking mechanism of the spray gun and the supply receptacle, respectively, the connector prong pairs of said spray gun and said supply receptacle being interfittingly receivable within respective pairs, each, of said connector body members.

3,871,585

AIR BED

Phillip E. Crossman, Ada; Robert C. Kenrick, Grand Haven, and Robert W. LeMieux, Spring Lake, all of Mich., assignors to The Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 179,659, Sept. 13, 1971, Pat. No. 3,773,325. This application Sept. 17, 1973, Ser. No. 397,700
Int. Cl. B05b *1/14;* **F23d** *13/44*
U.S. Cl. 239—553.3 **4 Claims**



1. An air bed comprising,

a top layer of material having a multiplicity of air jets exhausting upwardly therethrough and arrayed in a substantially uniform pattern over the surface thereof,

means for supporting said top layer of material comprising, a second layer of material affixed to the underside of said top layer, said top and second layers of material having a plurality of discrete air supply channels extending therebetween, each of said linear channels communicating with a selected number of said air jets,

said second layer having a plurality of ducts extending through the bottom surface thereof, each of said ducts communicating with at least one of said channels, and

means for forcing air upwardly through said ducts whereby it will flow through said channels and exhaust upwardly through said jets.

3,871,586

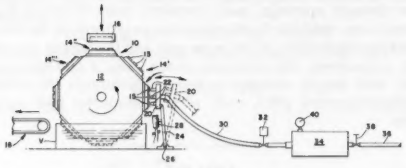
APPARATUS AND METHOD FOR FORMING MOLDED FIBER PRODUCTS WITH DECKLE-FREE WINDOWS

Henry A. Lord, Cape Elizabeth, Maine, assignor to Diamond International Corporation, New York, N.Y.

Filed June 19, 1972, Ser. No. 264,190
Int. Cl. B05b *1/30*
U.S. Cl. 239—569 **9 Claims**

1. Apparatus for use in forming deckle-free windows in molded fiber products comprising in combination a movable mold carrying member and an air distributor manifold box with jet outlet means on one face thereof and conduit means connected thereto whereby high pressure air may be introduced into said manifold box for discharge through said jet outlet means, said conduit means being connected to a high pressure air accumulator and including valve means controlling the flow of air from said accumulator, through said conduit means and to said manifold box, said manifold box being

provided with movable support means whereby said manifold box may be moved to and from a discharging position to which one of a plurality of movable forming molds on said movable



mold carrying member is moved into registration therewith and against which high pressure air from said jet outlet means may be directed to thereby blast deckle off the surface on which it is deposited.

3,871,587

METHOD OF AND APPARATUS FOR SPREADING FERTILIZER

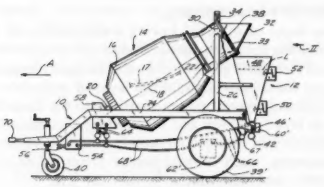
Josef Gail, 8891 Aichach, Unterwittelsbach, Germany

Filed May 30, 1973, Ser. No. 365,076

Claims priority, application Germany, May 31, 1972, 2226605

Int. Cl. A01c *23/00*

U.S. Cl. 239—662 **18 Claims**



1. A fertilizing apparatus comprising:

a chassis displaceable along the ground;

a concrete-mixer type drum on said chassis having an upper end formed with a mouth;

support means on said chassis for rotation of said drum about an axis inclined to the horizontal;

drive means on said chassis for rotating said drum about said axis in one sense for mixing material in said drum and in the opposite sense for displacing the mixed material out of said mouth;

spreader means on said chassis adjacent said mouth and including at least one horizontal member extending transverse to the direction of displacement of said chassis for distributing the material emitting from said mouth on the ground at a multiplicity of spaced locations along said member;

a flat gate hinged on said chassis above said mouth and overlying same, said gate being provided with an upwardly open funnel and being formed at the base of said funnel with a hole ; and

a flap hinged to said gate and normally covering said hole on the face of said gate away from said funnel, and spring means urging said flap into a position covering said hole.

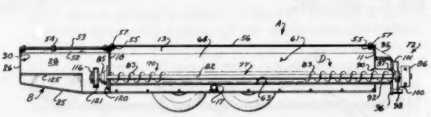
3,871,588

ROCK DUSTER

John B. Long, Daniels, W. Va., and John B. Stricklin, Jr., Knoxville, Tenn., assignors to The Marmon Group, Inc., Chicago, Ill.

Filed Oct. 1, 1973, Ser. No. 402,425

Int. Cl. E01c *19/20*

U.S. Cl. 239—673 **22 Claims**

1. In a mobile distributor for bulk material such as rock dust and the like, the combination of a frame, hopper means mounted on said frame for receiving bulk material, and bulk material distributor means including conveyor means and spreader means, said conveyor means extending into said hopper means for moving bulk material therethrough to said spreader means, and said spreader means including means for discharging bulk material outwardly of said mobile distributor, said bulk material distributor means including rotatably supported shaft means, drive means for rotating said shaft means, and means for dynamically unbalancing said shaft means in a manner to impart vibratory motion to said hopper means on rotation of said shaft means.

3,871,589

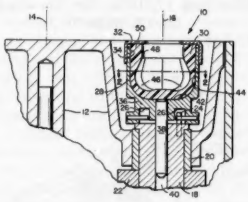
AMALGAM MULLING CONTAINER

Frank N. Lentine, Taylor, and Harold H. Simpson, Fraser, both of Mich., assignors to Sybron Corporation, Rochester, N.Y.

Filed Jan. 18, 1974, Ser. No. 434,509

Int. Cl. B02c *17/22*

U.S. Cl. 241—102 **7 Claims**



1. In an amalgam producing machine including a rotor member, a cup for reception of the amalgam ingredients comprising:

a. a body portion having an open end and a closed end including means for connecting said body portion to said rotor for rotation in an orbital path about a vertical axis laterally spaced from the axis of rotation of said rotor;

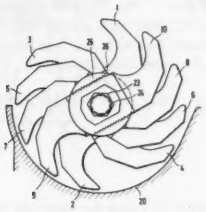
b. a removable cup-shaped insert fitted to said body portion for directly receiving the amalgam ingredients, said insert being of a resilient material so that upon rotation in said orbital path centrifugal force will cause said amalgam ingredients to strike and deform the wall of said insert promoting mulling of said ingredients; and

c. means positionable over said insert and connectable to said body portion for securing said insert in said body portion.

3,871,590
BLADE ARRANGEMENTS FOR MEAT CUTTERS

G. Walter Steffens, Unterholter Strasse 60, 5630 Remscheid, Germany

Filed June 25, 1973, Ser. No. 372,954
Claims priority, application Germany, Mar. 6, 1973, 2310997
Int. Cl. B02c *18/14, 18/18*
U.S. Cl. 241—282.2 7 Claims



1. In a cutter head for processing meat including a plurality of pairs of meat-cutting blades mounted on a profile shaft, each pair of blades comprising two blades displaced angularly by 180° in relation to one another and disposed in axially succeeding relationship to each other, one axial end of said cutter head defining a meat-insertion end; the improvement comprising:

a first pair of said blades being mounted adjacent the meat-insertion end of the cutter head;

a second pair of said blades being mounted in axially and angularly succeeding relation to said first pair of blades; and

at least third and fourth pairs of said blades being mounted in axially and angularly succeeding relationship to said second pair of blades and to each other;

the angular spacing between said second and third pairs of blades, and between said third and fourth pairs of blades, being substantially equal;

the angular spacing between said first and second pairs of blades being greater than the angular spacing between said second and third, and third and fourth, pairs of blades; and

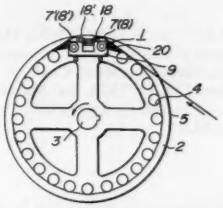
the angular spacing between said first and second pairs of blades, said second and third pairs of blades, and said third and fourth pairs of blades totals less than the 180° spacing between said first pair of blades.

3,871,591
DEVICE FOR SIMULTANEOUSLY MANUFACTURING A PLURALITY OF FIBER BUNDLES

Rikizo Murata, Tokyo, Japan, assignor to Olympus Optical Company, Limited, Tokyo, Japan

Filed Sept. 17, 1973, Ser. No. 397,786
Claims priority, application Japan, Sept. 16, 1972, 47-93091
Int. Cl. B65h *54/00*
U.S. Cl. 242—18 G 4 Claims

1. A device for manufacturing a plurality of fiber bundles comprising a disk reel rotatably mounted on a rotary shaft; a base plate secured at its one end by a mounting plate to said disk reel and extending perpendicular to said disk reel and having at its each end an end plate; a number of parallel partition plates secured to said base plate and arranged between said end plates in two longitudinal rows and spaced apart one from the other, said two longitudinal rows being spaced apart from each other along the outer periphery of said disk reel; two longitudinal shafts slidably and rotatably supported by said end plates and extending through said parallel partition plates; a number of pairs of slit forming plates, each pair of slit forming plates being detachably mounted on each of said two longitudinal shafts; a spacer detachably sandwiched between said each pair of slit forming plates and having a thickness substantially larger than the diameter of a fiber to be wound; a resilient engaging member comprised of a collar integral with said longitudinal shaft and an elastic member fitted around said longitudinal shaft and in contact with one of each pair of said slit forming plates; a spring inserted between one of said shaft ends and said plate and urging said



longitudinal shaft toward the other shaft end; and means for axially moving said shaft against the action of said spring and comprised of a nut secured to said end plate and a knob threadedly engaged with said nut, whereby said each pair of slit forming plates are urged against corresponding partition plates to form a slit with gap substantially larger than the diameter of one fiber and having wound therein fibers in superimposed relation.

3,871,592
APPARATUS FOR WINDING GLASS STRANDS

John Kallenborn, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 3, 1973, Ser. No. 385,361
Int. Cl. B65h *54/44, 74/24*
U.S. Cl. 242—18 G 2 Claims

1. An apparatus for winding strand onto a forming package comprising in combination a motor having a centrally disposed statinary shaft; a stator mounted on said shaft; a rotor circumferentially disposed around said stator; a hub member secured to the outer circumference of said rotor and rotatable therewith; a plurality of channels and slots positioned along the long axis of said hub member on the exterior surface thereof; a plurality of longitudinal elongated fingers and wedge members received in said channels each of said fingers being characterized by having sloping side portions and a centrally disposed tongue member slideably engaging a respective one of said slots longitudinal tongue members positioned along the long axis of the hub and engaging a slot in respective wedge members; the side portions of said fingers and the vertical axis of said tongue members on said hub

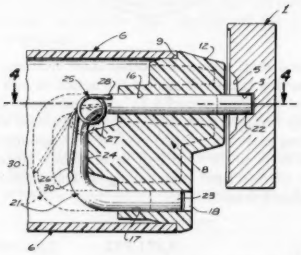
forming a nonlocking angle between the wedge members and the fingers member associated therewith, said fingers and said wedge members being characterized by being movable in an axial direction when the motor is actuated by centrigugal force until they lock by engagement with the side portions of each to form a smooth unbroken peripheral surface and being freely retractable when at rest by gravitational forces.

3,871,593

TOILET TISSUE DISPENSING MANDREL

William Brinton, Northridge, Calif., assignor to The Bobrick Corporation, North Hollywood, Calif.

Filed Feb. 19, 1974, Ser. No. 443,402
Int. Cl. B65h *19/00*
U.S. Cl. 242—55.2 **7 Claims**



1. The combination with a bracket member having parallel arms and aligned bearing sockets, of a toilet tissue dispensing mandrel, comprising:

a. a sleeve extending between the bracket arms;

b. means journalling one end of the sleeve in one of the bearing sockets;

c. an end fitting for the other end of the sleeve including parallel guide bores, one bore being in axial alignment with the journal means, the other being offset therefrom;

d. a slide member including a journal pin and an operating pin, slidable in the guide bores, and means operatively connecting the pins, the journal pin being movable between an extended position for reception in the other bearing socket to define the axis of rotation of the fitting and sleeve, and a retracted position clearing the bearing socket to permit removal and replacement of the mandrel, the operating pin being accessible for end engagement to effect retraction of the journal pin;

e. and yieldable means for urging the slide member in a direction to extend the journal pin.

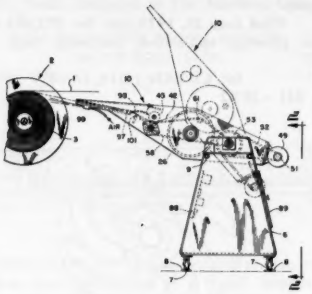
3,871,594

RECOILER PAPER STUFFER

Francis P. O'Neil; Ferd A. Krauss, both of Bay Village; Vincent Sambenedetto, Cleveland, and Christopher C. Cooper, Sheffield Lake, all of Ohio, assignors to The Yoder Company, Cleveland, Ohio

Filed Aug. 1, 1972, Ser. No. 276,978
Int. Cl. B65h *19/04, 35/02, 35/00*
U.S. Cl. 242—56 R **18 Claims**

3. A paper stuffer selectively for positioning cut paper strips between convolutions of a loosely wound strip coil or the like on a driven recoiler comprising paper feed means operative to direct the paper into the nip of the outer convolution of the coil and severing means between the coil and the feed means, means to place the paper between said feed means and coil in tension, and means responsive to a preselected tension of such



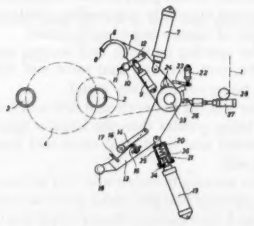
paper being obtained to cause the severing means to cut the paper.

3,871,595

AUTOMATIC WINDING AND CUTTING APPARATUS FOR WEBS

Albert Emiel Smolderen, Aartselaar, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

Filed Dec. 12, 1973, Ser. No. 423,980
Claims priority, application United Kingdom, Dec. 13, 1972, 57450/72
Int. Cl. B65b *19/20*
U.S. Cl. 242—56 A **12 Claims**



1. A web winding and cutting apparatus for converting a continuously travelling web into rolls, said winding apparatus comprising:

a. a supply station from which the web to be cut is fed,

b. a turret for supporting at least two cores, said web being wound up onto one of these cores, with the remainder empty and in stand-by position,

c. means for rotatably driving the respective cores at a predetermined rotational speed,

d. cutting means for cutting said web after a predetermined length of said web has been wound onto said core, said cutting means comprising a knife mounted on a first arm, means for biasing said arm to cutting position, releasable detent means restraining the arm from moving to said cutting position and energy storage means between said biasing means and said arm to store the biasing force of said biasinng means until said detent means is released,

e. guide means for guiding the leading edge of said cut web onto said empty core, said guide means comprising a guide shell for encircling said empty core, at least one idler roller capable of rotating against the web adjacent said knife during cutting and at least one slippingly driven roller downstream of said guide shell for tightening the web against the core after cutting, said slippingly driven roller being driven at a circumferential speed exceeding

the circumferintial speed of said empty core and having a coefficient of friction relative to the web greater than the coefficient of friction of said empty core relative to the web, and

f. means to support said guide means.

3,871,596

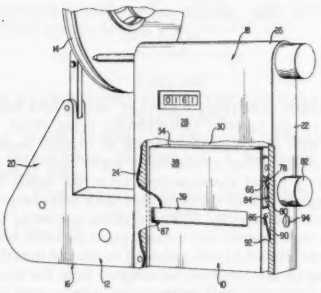
MAGAZINE FOR STORING AN INFORMATION TAPE

Paul A. Morgan, Chicago, Ill., assignor to Century Wheels, Inc., Lake Bluff, Ill.

Continuation-in-part of Ser. Nos. 295,225, Oct. 5, 1972, Pat. No. 3,845,564, and Ser. No. 238,340, March 27, 1972, Pat. No. 3,810,310. This application Sept. 18, 1973, Ser. No. 398,461

Int. Cl. G03b *1/04*; **G09f** *11/24*

U.S. Cl. 242—71.2 **32 Claims**



1. A magazine insertable into and removable from a housing comprising: a frame, first and second spaced-apart rotatable spools mounted on said frame, a tape wound on said spools, a first rotatable member attached to one of said spools, a second rotatable member attached to the other of said spools, a connecting means in the form of at least one third rotatable member connecting said first and second rotatable members to transmit rotary motion from said first rotatable member to said second rotatable member and thereby drive said spools, and a locking means in the form of a resilient means secured to the frame of the magazine for locking the magazine in the housing.

3,871,597

LABELING APPARATUS

Herbert LaMers, Los Angeles, Calif., assignor to R. A. Jones & Company, Inc., Covington, Ky.

Division of Ser. No. 89,492, Nov. 13, 1970, Pat. No. 3,776,801, which is a division of Ser. No. 756,651, Aug. 30, 1968, Pat. No. 3,661,625. This application Apr. 17, 1973, Ser. No. 351,829

Int. Cl. B65h *23/24*, *25/32*

U.S. Cl. 242—75.3 **7 Claims**

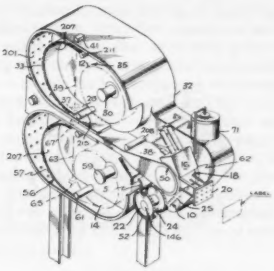
6. Apparatus for forming a loop in a label supply web including

a label supply chamber,

a wound elongated label-carrying web disposed for unwinding rotation within the chamber,

a flexible curtain having one end attached to the apparatus adjacent said wound web and on one side of said web,

said curtain disposed so that said web, when unwound, is drawn over one web-engaging side thereof, and said curtain having a free end opposite said attached end, and means for establishing a decreased pressure on said web-



engaging side of said curtain to draw said curtain against the web and to form a loop in the web.

3,871,598

WINDING TENSION CONTROL SYSTEM

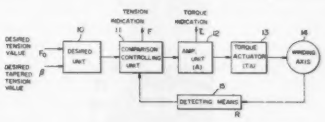
Hiroshi Kataoka, Iyo-Mishima, Japan, assignor to Kataoka Machine Product Co., Ltd., Iyo-Mishima-shi, Ehime-ken, Japan

Filed July 16, 1973, Ser. No. 379,836

Claims priority, application Japan, July 17, 1972, 47-71419

Int. Cl. B65h *25/04*

U.S. Cl. 242—75.51 **2 Claims**



1. A winding tension control system comprising:

a. a winding shaft for taking up a sheet into a roll state,

b. detecting means for continually detecting the radius of a winding roll under a winding operation,

c. an arithmetic circuit which calculates a tensile value at an arbitrary radius of said winding roll on the basis of a theoretical equation,

d. a comparison control unit which multiplies a winding radius-detecting signal obtained by said detecting means, by said tensile value calculated by said arithmetic circuit and which thus outputs a desired winding torque signal, and

e. a torque actuator which controls a winding torque of said winding shaft by the output signal from said comparison control unit.

3,871,599

AUTOMATIC LOCKING SAFETY BELT RETRACTION REEL

Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed June 13, 1973, Ser. No. 369,656

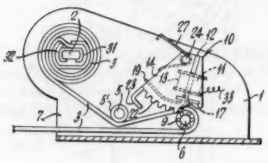
Claims priority, application Japan, June 17, 1972, 47-71004

Int. Cl. A62b *35/00*; **B65h** *75/48*

U.S. Cl. 242—107.2 **8 Claims**

1. An automatic locking vehicle safety belt system comprising a belt retractor reel, a belt extending from said retractor reel, spring means urging said reel to rotate in a belt retracting direction, a rotatable drive member engaged and driven by said belt and spaced from said reel, a locking member movable between an advanced position locking said belt against withdrawal and a retracted position, means resiliently urging

said locking member to its retracted position, drive coupling means movable between a disengage position and an engage position drive coupling said locking member to said drive



member to advance said locking member with the rotation of said drive member toward its advanced position urging a portion of said belt to said drive member and means for advancing said drive coupling means to said engage position.

3,871,600

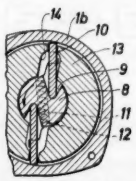
VEHICLE SAFETY BELT WITH INERTIA RESPONSIVE BRAKE

Stig Martin Lindblad, 440 20 Vargarda, Sweden

Filed Oct. 18, 1971, Ser. No. 189,916

Int. Cl. B65h *75/48*

U.S. Cl. 242—107.4 **1 Claim**



1. A winding-up device for a vehicle safety harness comprising a belt, a housing a shaft rotatably mounted in said housing, a roller mounted on said shaft for rotation therewith and having said belt partially wound thereon, said housing having a cavity defined by a cylindrical inner wall into which a portion of said shaft extends, said shaft portion having axially extending grooves each of a V-shaped cross-section, plates each having an end pivotally supported in one of said shaft grooves and extending in a transverse plane to said shaft, at least one spring tending to retain said plates in their respective shaft grooves, said plates each having a length in a direction from its respective shaft groove bottom exceeding the radial distance from its respective shaft groove bottom and said cylindrical inner wall, an inertia element rotatably mounted on said shaft portion and having radially directed openings through which said plates extend whereby said inertia element can engage said plates upon a rapid acceleration of said shaft in the belt winding-off direction of said roller causing said plates to pivot on said shaft groove bottoms into engagement with said cylindrical inner wall preventing further rotation of said roller, said shaft having at least one bore extending between a pair of said grooves, said spring being positioned in said bore and said spring having its ends connected to the plates in said pair of grooves tending to retain said plates against the bottom of their respective groove.

3,871,601

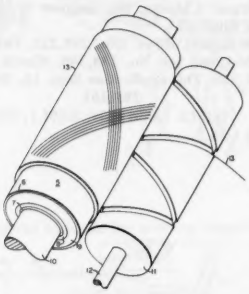
COMPOSITE STRUCTURE AND HIGH SPEED BOBBIN

Thomas G. Crawford, Hampton, and William E. Kearse, Fairfax, both of S.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 6, 1972, Ser. No. 260,090

Int. Cl. B65h *75/10*

U.S. Cl. 242—118.32 **15 Claims**



6. A bobbin comprising a cylinder having four layers, the outside external layer of said cylinder being about 1/32 to about ⅛ inch thick and comprising an organic material selected from the group consisting of paper and cloth impregnated with a cured thermosetting resin, the inside external layer being about 6 to about 60 mils thick and comprising an organic material selected from the group consisting of paper and cloth impregnated with a cured phenolic resin, one of the two internal layers (A) being about 3 to about 6 mils thick and comprising an organic material selected from the group consisting of paper and cloth impregnated with a cured phenolic resin, and the other internal layer (B) being a composite structure which comprises about 8 to about 32 sheets of glass cloth, each sheet separated from adjacent sheets by at least one sheet of an organic material selected from the group consisting of paper and cloth, said sheets being impregnated and bonded together with a cured phenolic resin.

3,871,602

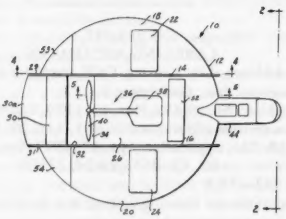
CIRCULAR WING AIRCRAFT

Curtis D. Kissinger, Gloversville, N.Y., assignor to Panaflight Corporation, Albany, N.Y.

Continuation of Ser. No. 198,704, Nov. 15, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 394,195

Int. Cl. B64c *3/12*

U.S. Cl. 244—13 **6 Claims**



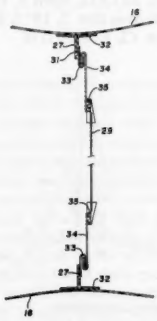
1. An improved aircraft including in combinataion, a main airfoil having a first certain outline configuration when viewed from the top thereof, respective elongated vertical members on opposite sides of and equally spaced from the fore-and-aft centerline of said main airfoil, said vertical members extending generally parallel to said fore-and-aft axis throughout said

airfoil from the leading edge thereof to the trailing edge thereof and positioned inboard of the outboard edges of said airfoil to divide said main airfoil into a relatively independent central section between said members, and respective outer sections outboard of said members, said members projecting above the upper surface of said main airfoil and projecting below the under surface of the main airfoil to form tunnel-like spaces for the flow of air from the leading edge to the trailing edge of the airfoil over and under the central section thereof, said outer sections extending rearwardly of said central section to provide outer section inboard edges extending rearwardly from the trailing edge of said central section to the trailing edges of said outer sections, said inboard edges and said central section trailing edge forming a second certain outline configuration, a horizontal stabilizer formed with a leading edge and outer edges in said second outline configuration, and means including upwardly extending portions of said vertical members adjacent to the trailing edges of said outer sections to provide vertical stabilizers for mounting said horizontal stabilizer above said main airfoil and with the leading edge of said horizontal stabilizer spaced rearwardly from said central section trailing edge, said central section being formed with a concave bottom surface and said outer sections being formed with convex bottom surfaces.

3,871,603
FIN ATTACHMENT FOR TETHERED BALLOON STRUCTURES

James A. Menke, Shakopee, and Robert G. Witherow, Northfield, both of Minn., assignors to G. T. Schjeldahl Company, Northfield, Minn.

Filed May 30, 1974, Ser. No. 474,592
Int. Cl. B64b *1/42*
U.S. Cl. 244—125 **5 Claims**



1. An inflatable, lighter-than-air aerostat structure having an inflated elongated hull with a central axis, and with a nose assembly and an empennage assembly at opposed ends thereof, said empennage assembly comprising a plurality of stabilizing fins extending outwardly from said hull;

a. said stabilizing fins comprising a generally enclosed structure having opposed spaced apart side walls of flexible film extending from the root to the tip thereof and defining said fin, the inner surfaces of said side walls of said stabilizing fins having catenary lines securing said walls together;

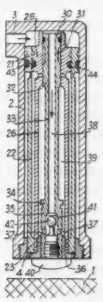
b. a plurality of elongated generally parallelly disposed catenary anchoring web means secured in generally oppositely disposed relationship to opposed inner surfaces of said stabilizing fin side walls and extending generally parallel to the longitudinal axis of the fin from the root to the tip thereof and having body means for anchoring said catenary lines thereto at spaced points along the length of said anchoring web;

c. said catenary lines being arranged in a geometrical pattern wherein said lines extend in coupling relationship to opposed anchoring webs, and wherein each anchoring web has a plurality of spaced anchoring points therealong with each anchoring point having at least one catenary line coupled thereto with a first segment of said catenary line extending from a first anchoring point on a first anchoring web along an axis extending generally normal to the axis of said fin to an opposed anchoring point on an opposed anchoring web and with the next adjacent catenary line segment extending from said opposed anchoring point along an axis extending diagonally outwardly from said first catenary line segment across said fin at substantially equal acute angles to the planar axis of said fin to outwardly spaced anchoring points on said first anchoring web disposed in spaced relationship from said first anchoring point to form a plurality of scalloped ribs along said fin surface.

3,871,604
RETRACTABLE JETTISONING EJECTOR FOR AIRCRAFTS

Pierre Fernand Coutin, 117 avenue du General Michel Bizot, 75012 Paris, France

Filed Oct. 26, 1973, Ser. No. 410,231
Claims priority, application France, Nov. 2, 1972, 72.38748
Int. Cl. B64d *1/02, 37/12*
U.S. Cl. 244—137 R **1 Claim**



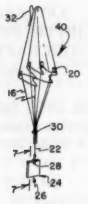
1. A retractable ejector device for jettisoning a load from an aircraft comprising a cylinder having an inlet port at one end and a restricted open end, a two section telescopic piston positioned in and spaced from said cylinder, each section of said piston having a hollow interior open at both ends of said piston, a first section of said piston having a head at its inner end portion, slideable in said cylinder and of a greater diameter than said cylinder restricted open end, a restriction in the hollow interior of said first section, at least one port through the inner end portion of said first section, a second section of said piston having a head at its inner end portion, slideable in said first section and of a greater diameter tham said restricted interior of said first section, a restriction in the hollow interior of said second section and at least one port through the inner end portion of said second section, a tubular distributor positioned in and spaced from said second section hollow interior, having a head at its inner end slideable in said second section, an exterior recess in said tubular distributor head, a flange at its other end portion of greater diameter than said second section restriction, a chamber at the lower portion of said tubular distributor, means closing said chamber at its outer end, a valve seat formed at the upper end of this chamber, a ball in said chamber maintained in the vicinity of said valve seat by said closing means, ports in said chamber disposed under said flange and connecting said chamber to the hollow interior of said second section in a retracted position of said

distrubutor while said ports connect said chamber to the atmosphere in an extended position of said distributor, said ball being removed from said valve seat when gas pressure in said tubular distributor is higher than the gas pressure in said hollow second section, and said ball being forced against said valve seat as soon as the gas pressure in said hollow second section becomes higher than the gas pressure in said hollow distributor.

3,871,605
TOY PARACHUTE

Sam Kupperman, Chicago, and Dennis I. Kupperman, Skokie, both of Ill., assignors to R B Toy Development Co., Skokie, Ill.

Filed Dec. 3, 1973, Ser. No. 420,959
Int. Cl. A63h *27/08*
U.S. Cl. 244—155 R **5 Claims**



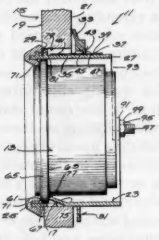
1. A toy parachute formed of a plurality of disassembled parts which are readily assembled by a child to form a complete parachute and comprising, a flexible parachute body having a center, a plurality of separate shroud lines each having one of their ends attached to the flexible body by a pressure sensitive adhesive tape with the balance of the line extending below the flexible body, a hook member having a lower U-shaped end and an upper inverted U-shaped end with the lower U-shaped end attachable to the top of the flexible body by a pressure sensitive adhesive tape, said hook member being attached to the outside surface of the flexible parachute body in a position removed from the center of the flexible parachute body, said upper inverted U-shaped end of said hook member adapted to be hooked to the lower end of a kite line with the opposite end of the kite line secured to a kite adapted to be flown, with the lower end of the line held by the operator, said toy parachute being so constructed that the wind will carry the parachute up the line in the direction of the kite, said parachute adapted to be released from said line for free descent by jerking the line to release the hook member and parachute from the kite line, and a weight member secured to the lower end of said shroud lines.

3,871,606
INSTRUMENT MOUNT

Martin E. Larson, Kenosha, Wis., and Irvin M. White, Rio, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 21, 1973, Ser. No. 343,375
Int. Cl. G12b *9/04*
U.S. Cl. 248—27 **6 Claims**

1. An instrument mounting for a dashboard having an opening therein, said mounting comprising a housing including a tubular portion extending through the dashboard opening, means on said margin of the dashboard around the opening to limit housing movement relative to the dashboard in the direction from the front to the rear, a housing retainer member adapted to engage the rear of the dashboard, selectively engageable means on said housing retainer and on said housing for preventing housing movement relative to the dashboard in the direction from the rear to the front, an instrument received in said tubular housing portion, means extending inwardly of said housing for engagement with said instrument to limit forward instrument insertion and to limit rearward instrument withdrawal from said housing, and cooperating means on said instrument and on said housing and on the dashboard for affording predetermined angular orientation of said instrument relative to the dashboard and for preventing relative angular movement of said instrument relative to the

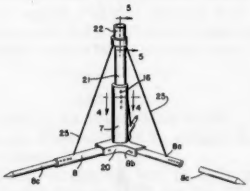


dashboard, said cooperating means including a step in the rear edge of said housing and a wing extending radially from said instrument and located in said step in response to instrument insertion into said housing so as thereby to afford predetermined angular orientation between said instrument and said housing and to prevent relative angular movement therebetween.

3,871,607
COLLAPSIBLE TRIPOD SUPPORT

Benjamin D. Pile, Colorado Springs, Colo., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 347,533, April 3, 1973, Pat. No. 3,783,262. This application Oct. 2, 1973, Ser. No. 402,667
Int. Cl. F16m *11/38*
U.S. Cl. 248—171 **4 Claims**



1. A support structure comprising:

a. a member having a central hub, a plurality of radially disposed U-shaped channels extending horizontally from said central hub and a recess located in said central hub, said U-shaped channels opening downwardly in operating condition;

b. an extendible section fitting into said centrally disposed recess;

c. a plurality of flexible cables depending from the upper portion of said extendible section;

d. connecting means fixedly secured to said extendible section fastening said flexible cables to the upper portion of said extendible section, said connecting means having a first internal circular recess with a plurality of vertically disposed slots communicating with a second internal circular recess of greater diameter than said first recess, said slots receiving said cables and said second recess receiving said cable ends, said cable ends being larger in diameter than said cables and said slots; and

e. a plurality of legs, each of said legs fitting into one of said U-shaped channels, means for rotatably securing said legs to said channels and means for connecting said cables to

said legs, whereby when said extendible section is extended said cable ends are held in a fixed position against the smaller diameter slots and said cables are placed in tension and draw said legs into a substantially horizontal operating position such that said legs are in contact with the bight of said U-shaped channels, which act as a stop.

3,871,608

DISPLAY BOARD

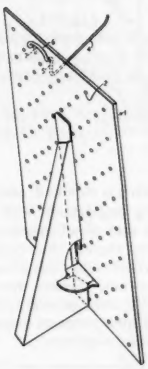
Bruce Robert Ogden, 7 Rawson Cres., Pymble, New South Wales, Australia

Filed May 15, 1973, Ser. No. 360,465

Claims priority, application Australia, May 22, 1972, 9028/72

Int. Cl. A47g *23/02;* **A47b** *3/00;* **A47f** *5/00*

U.S. Cl. 248—223 **5 Claims**



1. A display board assembly comprising a board made from soft, easily tearable sheet material and at least one load supporting bracket means engaged with the board, said board having at least one aperture therethrough, said bracket means being bent from continuous rod and comprising a first portion extending away from one board surface, an elongated second portion angled upwardly relative to the first portion and abutting said one board surface, a third portion angled to said second portion, extending through said aperture and having a length substantially equal to the thickness of said board, a fourth portion angled to said third portion and lying behind and substantially parallel to said second portion and abutting the other surface of said board, said fourth portion being shorter than said second portion, and a fifth portion co-planar with said fourth portion and also abutting said other surface of said board along the entire length of said fifth portion, said fifth portion extending in a direction opposite to the direction of the fourth portion and beyond said aperture, said second, fourth and fifth portions bearing against said board surfaces and providing load distributing abutments thereby preventing the tearing of said board in the vicinity of said aperture when a load is applied to the first portion.

3,871,609

PICTURE AND LAMP HOLDING BRACKET ASSEMBLY

Le Roy Benjamin, 501 N. Highland, Hollywood, Calif. 91604

Filed July 2, 1973, Ser. No. 375,959

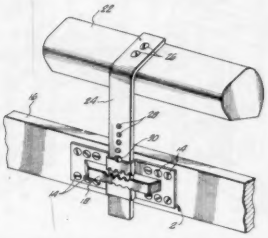
Int. Cl. F21v *33/00*

U.S. Cl. 248—496 **10 Claims**

1. A combination adjustable picture mounting and lamp holding bracket assembly adapted to be fastened to a picture frame and hung on a first support member for positioning the picture frame on a wall or the like and for further supporting a second member extending from the picture frame such as a lamp, comprising:

a pair of base members lying in a first plane and adapted to be secured to the picture frame;

at least one cross sectionally U-shaped member interconnecting the base members for supportingly receiving the lamp so that it extends beyond the perimeter of the picture frame; and



a serrated band member connected to each base member and lying substantially in a second plane wherein the U-shaped member is positioned substantially between the first and second plane, the band member extending beyond the U-shaped member for adjustably positioning the base portions and accordingly the picture frame relative to the first support member.

3,871,610

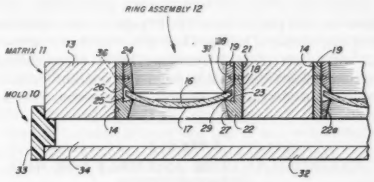
OPTICAL MOLD FORMING MEANS

Philip J. Balsam, Stamford, Conn., assignor to Beattie Development Company, Stamford, Conn.

Filed Sept. 14, 1972, Ser. No. 289,198

Int. Cl. B29c *1/02*

U.S. Cl. 249—102 **14 Claims**



1. A matrix for molding a plastic component comprising:

a. a frame having a plurality of apertures therein;

b. a plurality of ring assemblies positioned within said apertures, each of said ring assemblies comprising:

1. an annular sleeve having inner and outer walls;

2. first inner annular support means positioned within said sleeve adjacent said inner wall for defining a first shoulder with respect to said inner wall;

3. second inner annular support means positioned within said sleeve adjacent said inner wall for defining a second shoulder with respect to said inner wall, said first and second shoulders being positioned in faced relationship and spaced from each other for defining a substantially annular cavity therebetween; and

4. a mold element having a mold surface against which said plastic component is to be molded supported between said first and second shoulders; and

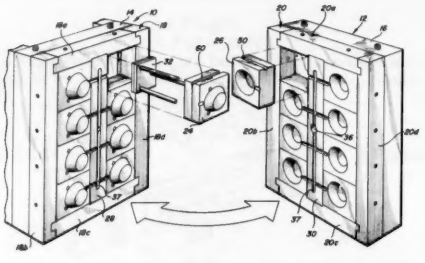
c. means for removably supporting said plurality of ring assemblies within said plurality of apertures.

3,871,611

MOLD WITH REMOVABLE AND REPLACEABLE CORE AND CAVITY INSERTS

Jun A. Taketa, Glenview, Ill., assignor to Phyllis Taketa, Glenview, Ill.

Filed May 7, 1973, Ser. No. 357,904
Int. Cl. B41b 11/62
U.S. Cl. 249—102 3 Claims



1. A mold assembly particularly adapted for use in the molding of materials comprising, in combination: a movable mold half and a fixed mold half, each of which includes a mold base having a pocket defined in the front face thereof in which a plurality of blocks are disposed, said blocks within said movable mold half each defining a core and said blocks within said fixed mold half each defining an associated cavity, whereby said blocks provide a plurality of mold cavities when said mold halves are closed, said blocks being precisely dimensioned to nest within said pockets, each of said blocks having at least one groove therein, a plurality of locking means threadedly disposed within the walls defining said pocket in the respective mold halves and positioned to lockingly engage within said groove of an associated one of said blocks to removably and fixedly secure said block within said pocket, said mold bases each have a plurality of piston means movably secured therein, at least one of said piston means being positioned to engage each of the respective ones of said blocks to forcibly urge them out of said pockets, a hydraulic bore in communication with the respective ones of said piston means and containing a medium which when compressed exerts a pressure on said piston means to engage it with said block to forcibly urge it out of said pocket, and a threaded screw associated with each of said hydraulic bores when threadedly manipulated functions to compress the medium within said hydraulic bore to exert a pressure on said piston means.

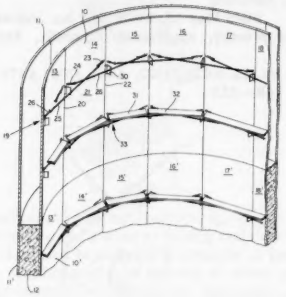
3,871,612

CYLINDRICAL CORE ASSEMBLY FOR SILO CONSTRUCTION

Richard L. Weaver, Rt. 1, Myestown, Pa. 17067

Division of Ser. No. 283,715, Aug. 25, 1972, abandoned. This application June 11, 1974, Ser. No. 478,224
Int. Cl. B28b 7/28
U.S. Cl. 249—184 2 Claims

1. A generally cylindrical inner mold form of ring-like construction, for use in the construction of poured concrete silos and the like, in which multiple rings of concrete or the like are poured one after the other between inner and outer mold rings without the use of a platform spanning inner rings of the mold form, and without the use of a ground-supported platform, the inner mold ring comprising a plurality of generally rectangular planar members of substantially similar sizes, arranged into a generally circular configuration, with adjacent vertical edges in abuttment, and with each said planar member having a pair of means for connecting tension members thereto, affixed to said planar member along opposite vertical edges thereof, at substantially the same vertical elevation, and including tension members each of a length slightly less than the horizontal width of two adjacent said planar members in abuttment, each said tension member being connected to a connecting means along one vertical edge of one planar member and being connected to a next adjacent planar member along a vertical edge thereof, and spanning the vertical edges of the adjacent planar members that are in abuttment with each other along a mating line, and including a tightening member carried by one of the planar members along the mating line of abuttment, for engaging said tension member, said tightening member being pivotally movable toward and away from the planar



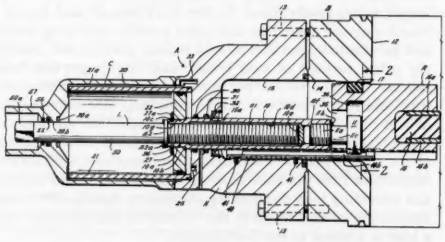
member upon which it is mounted, and correspondingly out of and into tightening engagement with said tension member, and wherein each said panel member has two said tension members connected thereto that cross each other substantially along the vertical center line of the planar member, with said connecting means, tension members, and tightening members being at the same general vertical elevation, in order to accommodate planar supports disposed on and carried by tightened said tension members.

3,871,613

NON-ROTATING RAM ROD LOCKING ASSEMBLY FOR BLOWOUT PREVENTER

Robert K. LeRouax, 2000 C Governor's Cir., Houston, Tex. 77018

Division of Ser. No. 178,713, Sept. 8, 1971, Pat. No. 3,791,616. This application Aug. 20, 1973, Ser. No. 389,705
Int. Cl. E21b 33/06
U.S. Cl. 251—1 6 Claims



1. A locking assembly for a blowout preventer ram, comprising:

a blowout preventer body having a lateral opening for movement of a ram therein;

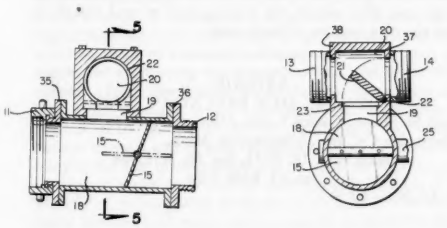
a blowout preventer ram bonnet having a ram recess therein aligned with said lateral opening in said body;

a blowout preventer ram adapted to move in and relative to said ram recess and said lateral opening for moving from a retracted position to a sealing position;

a ram rod having connection with said ram and having a hollow bore;

a piston cylinder mounted with said bonnet;
a piston disposed in said cylinder and having connection with said ram rod;
fixed guide means engaging said ram rod for preventing rotation of said ram rod;
a rotatable locking element mounted on said cylinder and adapted to extend into said cylinder for locking said piston in its inward position for thereby locking said ram in its sealing position;
said rotatable locking element having a rotatable stem therewith;
said rotatable stem extending into said cylinder and into the hollow bore of said ram for rotation and longitudinal movement relative thereto; and
means for rotating said locking element and said stem therewith to move said stem longitudinally and move said locking element from a retracted position to a locking position.

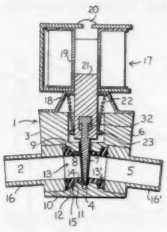
3,871,614
FOUR WAY HYDRANT VALVE
Robert T. Hughes, 10533 Tolling Clock Way, Columbia, Md. 21044, and R. Hurley Matthews, P.O. Box 662, Bel Air, Md. 21014
Filed Nov. 26, 1973, Ser. No. 418,860
Int. Cl. F16k *35/00*
U.S. Cl. 251—104 **6 Claims**



1. A valve system for controlling flow of water to a fire hose comprising a main valve body having a water inlet adapted to receive water from a fire hydrant and a water outlet adapted to feed water to a fire hose, a butterfly valve means in said body for controlling flow of water from said inlet to said outlet, a conduit having an inlet adapted for connection to a fire hose and an outlet also adapted for connection to a fire hose, the inlet and the outlet of said conduit being substantially coaxial to provide a direct straight path for the flow of water through the conduit whereby to minimize pressure losses, said conduit having an opening intermediate of the inlet and the outlet of said conduit and in communication with said main valve body upstream of the butterfly valve to permit flow of water from said main valve body to said conduit, and valve means at said opening operable in response to higher pressure at the inlet of the conduit than exists in said main valve body for closing the opening that allows water flow from said main valve body to said conduit.

2. A valve system as defined in claim **1** having a handle outside the main valve body for controlling the position of the butterfly valve, the position of the handle being an indication whether the butterfly valve is open or closed.

3,871,615
SOLENOID OPERATED WEDGE GATE VALVE
Verne P. Donner, Palatine, Ill., assignor to Deltrol Corp., Bellwood, Ill.
Filed Feb. 19, 1974, Ser. No. 443,763
Int. Cl. F16k *31/06*
U.S. Cl. 251—129 **1 Claim**



1. A solenoid operated gate valve including a valve body formed with an inner chamber, an inlet passage extending from one side of the valve body to said chamber, an outlet passage extending from the opposite side of the valve body to said chamber, said passages extending generally toward each other, means whereby said passages are terminated inside the valve body providing a wedge shaped space therebetween, said terminating means including valve seat inserts of soft elastic material, a wedge shaped valve member generally conforming to said wedge shaped space and arranged to engage said valve seat inserts for stopping flow of fluid from the inlet passage to the outlet passage, means including a solenoid having a plunger member for withdrawing said wedge shaped valve member from said seats to allow flow of fluid, lost motion means connecting said plunger and valve member, said lost motion means permitting initial free movement of the plunger member to develop inertia, the plunger member striking the valve member with hammer action when the lost motion is taken up for breaking the valve member loose from its wedging seats, the resiliency of said seats being such as to limit the holding force produced by the wedging action of the valve member and seats to less than can be overcome by the solenoid plunger member, said lost motion means comprising a compound slot in one member having a first portion extending parallel with the direction of movement of said members and extending through the end of its associated member, said slot also having a second portion of greater width than the first portion providing an internal shoulder, both portions of the slot opening through at least one side of said associated member, the other member including a shank portion extending through the first portion of the slot and a head portion providing a shoulder engaging said internal shoulder, said shank and head portions being insertable sideways into the slot.

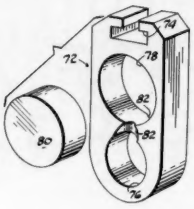
3,871,616
GATE VALVE DISC
Julian S. Taylor, 8300 S.W. 8, Oklahoma City, Okla. 73108
Filed Dec. 10, 1973, Ser. No. 423,596
Int. Cl. F16k *3/02*
U.S. Cl. 251—175 **3 Claims**

1. In a gate valve having a body provided with a flow passageway and having a disc receiving guide slot transversely intersecting the passageway, a valve stem having one end portion axially movable within the disc slot toward and away from the axis of the passageway and having a pair of disc seat rings formed from material having a Rockwell scale C hardness of at least forty disposed, respectively, on the upstream and downstream sides of the disc slot coaxial with respect to the passageway and defining confronting seat ring surfaces respectively disposed in the planes forming the upstream and downstream sides of the slot, the improvement comprising:

a metallic disc slidable within the disc slot,

said disc having a head portion removably secured to said one end portion of said valve stem for moving said disc and opening and closing the passageway,

said disc having a transverse U-shaped opening, at least equal in area to the transverse cross-sectional area of the passageway, in its end portion opposite said disc head portion and having a transverse aperture communicating with the U-shaped opening and coaxial with



the passageway when said disc is in valve closed position and being at least diametrically equal to the diameter of the passageway; and,

a plug formed of material having a Rockwell scale C hardness of at least forty freely received by the disc aperture and slidably interposed between said disc seat rings for coaxially registering and sealing with said disc seat ring on the downstream side of the disc slot and closing the passageway when said disc is moved to a valve closed position.

3,871,617

PILE DRIVER

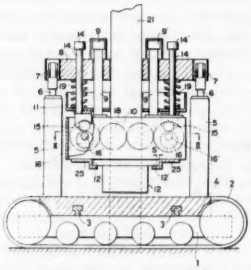
Keiichiro Majima, 1380-2 Nishitoyoi, Kudamatsu, Japan

Filed June 28, 1973, Ser. No. 374,382

Claims priority, application Japan, May 18, 1973, 48-55329

Int. Cl. E02d 7/18; B06b 1/10

U.S. Cl. 254—29 R **6 Claims**



1. A pile driver comprising a foundation and hydraulic cylinder means vertically mounted upon the foundation, a top bed connected to the hydraulic cylinder means adapted to move in a vertical direction upon activation of the hydraulic cylinder means, pile-holding chuck means below the top bed and adjustably connected thereto, an oscillating body between the top bed and the chuck means, spring means between the oscillating body and the top bed for deflecting the oscillating body in a downward direction, and rotatable cam means provided on the pile-holding chuck means contacting the oscillating body and sequentially compressing the spring means as the cam means rotates.

3,871,618

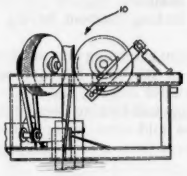
PORTABLE WELL PIPE PULLER

Eldon E. Funk, R.R. No. 2, Newville, Pa. 17241

Filed Nov. 9, 1073, Ser. No. 414,224

Int. Cl. E21b 19/08

U.S. Cl. 254—30 **6 Claims**



1. A well pipe puller comprising a U-shaped base having opposed legs defining an opening on one side of the base, attachment means on the base for securing the base to a well casing, and a wheel on the base having a well pipe-engaging surface facing said opening and positioned above said attachment means; and a support separable from said base having opposed edges extending along and removably mountable on said legs to close said opening, and a wheel rotatably mounted on said support having a well pipe-engaging surface; locking means for securing said support and base together with the pipe-engaging surface of the wheel on the support above the attachment means on the base; and means for moving one wheel toward the other wheel to confine the pipe between the wheels and drive means for rotating one of said wheels to move the pipe relative to the casing.

3,871,619

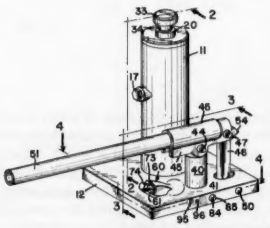
HYDRAULIC JACK BASE STRUCTURE

Ernest M. Simon, Golden Valley, Minn., assignor to K-P Manufacturing Co., Inc., Minneapolis, Minn.

Filed Mar. 18, 1974, Ser. No. 451,908

Int. Cl. B66f 3/24

U.S. Cl. 254—93 R **2 Claims**



1. In a hydraulic jack having a fluid reservoir, a pressure cylinder, a pump cylinder, a pump inlet checkvalve, and combined valve means including a pump outlet checkvalve and pressure release valve:

a baseplate having openings arranged for communication with the pump cylinder, the pressure cylinder, and the fluid reservoir;

first passage means in said base, including the inlet checkvalve, extending between the fluid reservoir opening and the pump cylinder opening;

second passage means in said base, including the outlet checkvalve, extending between the pump cylinder opening and the pressure cylinder opening;

third passage means in said base, including the pressure release valve, extending between the pressure cylinder opening and the fluid reservoir opening;

said base comprising a flat plate having a tongue hydroformed therefrom so as to extend at one end at an acute angle above said plate and so as to be metallurgically unitary with said plate at its other end;

said second and third passage means extending continuously from said plate into said tongue transversely thereof near said other end thereof;

and said combined valve means extending longitudinally in said tongue from said one end thereof.

3,871,620

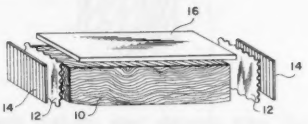
NONSKIDDING BLOCKS

Jack L. Moran, 1013 S. Bernice, Spearman, Tex. 79081

Filed Mar. 30, 1973, Ser. No. 346,327

Int. Cl. B66f *3/00*

U.S. Cl. 254—133 R **9 Claims**



1. A block of rectangular configuration for use in uniformly distributing the forces of a portable hydraulic jack to a metal surface in metal working and making body repairs wherein the improvement comprises a unitary nonskidding block consisting of a block of rectangular configuration of a material having a tensile strength and mechanical properties at least equivalent to those of Canadian white spruce; having butt plate means for reinforcing the strength of the said block and to provide a force-distributing surface to allow hammering of the said block to make minor adjustments of its position with respect to the said metal surface including a butt plate attached to each end of said rectangular block; and means to cling to the said metal surface and prevent the skidding of the said block under the forces of said hydraulic jack on at least the side of the said block to be placed in contact with the said metal surface, said means also serving to increase the tensile strength of said unitary block, whereby the said block may be placed in position on the said metal surface and held by its own forces in position subject to minor hammering adjustments during the placement of the said hydraulic jack to thereafter withstand, apply and uniformly distribute the forces of the said hydraulic jack to the said metal surface being worked on without slipping in the performance of metal working and body repairs.

3,871,621

CABLE CHUTE

Richard L. Jackson, Lewisburg, Ohio, assignor to Jackson Communication Corporation, Clayton, Ohio

Filed Sept. 21, 1973, Ser. No. 399,550

Int. Cl. E21c *29/16*

U.S. Cl. 254—134.3 PA **13 Claims**

1. A cable chute comprising:

a. a base frame,

b. a supporting rod fixed to and projecting from said base frame,

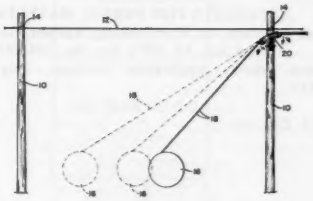
c. means for mounting said base frame on an existing member with said supporting rod projecting substantially vertically from said base frame,

d. collar means rotatably received on said supporting rod,

e. a pivot pin projecting substantially perpendicularly from said collar means and capable of rotational movement about an axis coincident with the axis of said supporting rod,

f. a roller frame,

g. means pivotally mounting said roller frame on said pivot pin for pivotal movement about the longitudinal axis of said pivot pin, and



h. a plurality of rollers rotatably mounted on said roller frame with the axes of said rollers extending in substantially parallel relationship to said axis of said pivot pin and the cable engaging surfaces of said rollers defining a generally arcuate path curving about a center extending parallel to said pivot pin.

3,871,622

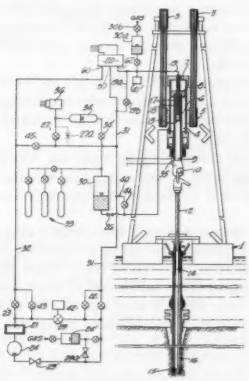
METHOD AND APPARATUS FOR THE CONTROL OF A WEIGHT SUSPENDED FROM A FLOATING VESSEL

Edward Larralde, and Glen Robinson, both of Santa Barbara, Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Continuation-in-part of Ser. No. 373,968, June 27, 1973, which is a continuation-in-part of Ser. No. 274,880, July 25, 1972, Pat. No. 3,841,607. This application July 13, 1973, Ser. No. 378,963

Int. Cl. E21b *15/02*

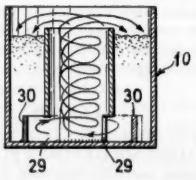
U.S. Cl. 254—172 **20 Claims**



1. In an apparatus adapted to be mounted on a vessel subject to heave due to wave action, which apparatus includes a hydraulic cylinder, a first piston and a first piston rod in said cylinder, means to connect a load to said first piston rod, a second hydraulic cylinder and a second piston in said second hydraulic cylinder; said second piston operatively connected to said first piston, separate pneumatic accumulator systems, one each connected to each one of said cylinders for control of the forces exerted on said piston rod, the improvement which comprises means separately to vary the pressure in a first of said accumulator systems, to modulate the pressure in said first accumulator system to compensate for change in pressure in a second accumulator system on imposition of a

load on said first piston, whereby the forces on said piston rod are maintained substantially constant.

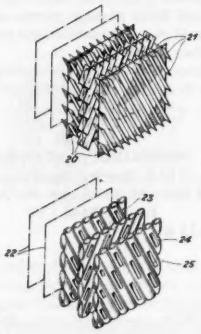
3,871,623
APPARATUS FOR MIXING MATERIALS
Dietmar Boenisch, 45, Morillenhang, Aachen, Germany
Filed July 24, 1972, Ser. No. 274,762
Claims priority, application Germany, July 26, 1971, 2137277
Int. Cl. B01f *5/10*
U.S. Cl. 259—2 **31 Claims**



1. A mixing apparatus for mixing fluent materials, particularly foundry molding materials, comprising:
a mix vessel having a vertical circumferentially enclosing side wall and resiliently mounted by means permitting an orbital oscillation about a vertical axis located within the confines of the vessel;
driving means imparting to said vessel and orbital oscillation in a horizontal direction thereby imparting a principally horizontally circular main flow to material contained in the vessel;
mixing means comprising at least one shaft-like element rigidly connected to and extending longitudinally within the vessel in a vertical direction away from the vessel bottom,
said mixing means having a horizontally concavely curved vertical surface and providing an opening to said surface facing toward the direction from which said main flow approaches, whereby said element intercepts a portion of the main flow through said opening to develop at least over the height of the element a separate flow with a circular motion.

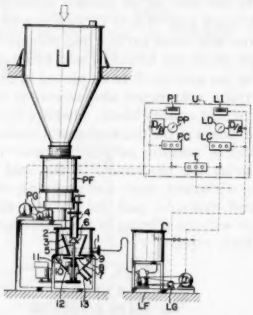
3,871,624
MIXING APPARATUS AND METHOD
Max Huber, and Gerhard Schutz, both of Winterthur, Switzerland, assignors to Sulzer Brothers, Ltd., Winterthur, Switzerland
Filed May 18, 1972, Ser. No. 254,645
Claims priority, application Switzerland, Jan. 24, 1972, 000982/72
Int. Cl. B01f *5/06*
U.S. Cl. 259—4 **16 Claims**

6. A mixing element comprising a plurality of layers, each layer having a spaced apart flat thin plate and a plurality of flat guide elements disposed angularly on at least one side of said plate with adjacent ones of said guide elements being in spaced apart parallel relation to define flow channels therebe-



tween. said guide elements being angularly disposed with respect to said guide elements of an adjacent layer.

3,871,625
CONTINUOUS FLOW JET MIXER
Hiroyuki Iwako, Tokyo, Japan, assignor to Funken Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 262,743, June 14, 1972, abandoned. This application Aug. 6, 1973, Ser. No. 386,027
Claims priority, application Japan, July 24, 1971, 46-54935
Int. Cl. B01f *5/26, 7/26*
U.S. Cl. 259—8 **17 Claims**



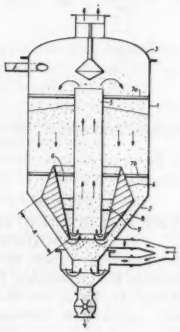
7. A continuous flow mixer comprising:
a tank having an outer wall and an inlet into said wall;
an open top overflow vessel disposed within said tank to provide an annular space between the tank wall and the vessel, into which space liquid entering from said inlet can circulate, the overflow vessel having an upper edge, a bottom outlet and an inner surface shaped to form a descending film of liquid which has circulated in said annular space and has risen to and overflown the upper edge of the overflow vessel, wherein the inner surface of the overflow vessel converges in the downward direction;
material inlet means to admit into said tank and into said overflow vessel a material of a type capable of being dispersed into said liquid; and
first dispersing means adjacent said material inlet means to disperse and distribute the admitted material into the

descending liquid film along the inner surface of the overflow vessel.

3,871,626
VESSEL FOR PNEUMATICALLY MIXING POWDERED OR GRANULAR MATERIAL

Arnon Wohlfarth, Nachlat-Jehuda, Israel, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 5, 1973, Ser. No. 348,419
Claims priority, application Germany, Apr. 20, 1972, 2219397
Int. Cl. B01f *13/02*
U.S. Cl. 259—36 **5 Claims**



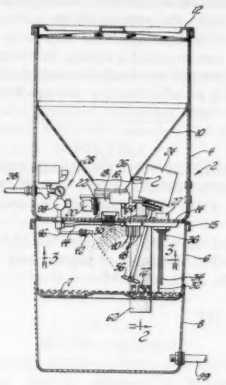
1. A vessel for pneumatically mixing powdered or granular material comprising a conical base with a bottom outlet and a gas inlet situated therein and within which an elevating tube is mounted, which terminates in the upper part of the vessel and which comprises an upper tube and a lower tube, an upper end portion of the lower tube being widened in the upward direction and surrounding the lower end of the upper tube leaving an annular channel therebetween, the lower tube forming a second annular channel with the wall of the vessel, the second annular channel having a cross sectional area such that in use the drop in pressure over the length of the elevating tube is at least substantially the same as the drop in pressure over the length of the second annular channel.

3,871,627
CHEMICAL MIXER

Arthur R. Marshall, Orchard Lake, Mich., assignor to Chemix Corporation, Troy, Mich.

Filed Feb. 26, 1973, Ser. No. 335,990
Int. Cl. B01f *3/12*
U.S. Cl. 259—64 **15 Claims**

1. Apparatus for mixing dry chemical with a liquid comprising: a mixing tank having a feed passage defined above the bottom wall thereof through which dry chemical is fed into the mixing tank and falls toward the bottom of the mixing tank into any liquid contained therein; and prewetting means for prewetting the dry chemical as it falls into the mixing tank from said passage, said prewetting means comprising a plurality of spray heads located on one side of the path of dry chemical falling from said passage and including a plurality of fluid nozzles for spraying liquid generally horizontally into the path of the dry chemical, and a fan nozzle located on the opposite side of the path of dry chemical falling from said passage for

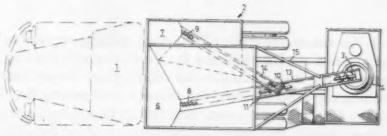


spraying liquid in a fan-shaped stream generally downwardly toward said bottom.

3,871,628
CONVEYING AND MIXING ARRANGEMENT, PARTICULARLY FOR POWDERED AND/OR PARTICULATE MASSES

Elgas Pulk, Stockholm, and John Paul Noren, Upplands Vasby, both of Sweden, assignors to Stabilator AB, Bromma, Sweden

Filed Dec. 5, 1972, Ser. No. 312,385
Claims priority, application Sweden, Dec. 10, 1971, 15876/71
Int. Cl. B28c *7/06*
U.S. Cl. 259—165 **7 Claims**



1. An arrangement for conveying and mixing at least two different dry particulate components and including for each such component a container and a conveyor driven by a power source, said conveyors being arranged to bring together from their respective containers such components into a driven mixing screw having a feed-in end and a feed-out end;
a first conveyor for a first component being a screw conveyor joined with and changing into the feed-in end of said mixing screw, said first conveyor having a smaller pitch and smaller diameter than said mixing screw;
said first conveyor and said mixing screw being substantially enclosed by a common casing having a substantially constant inner width;
said first conveyor and mixing screw having a common shaft of constant diameter;
a second conveyor for a second component being arranged to discharge and to feed the mixing screw above the feed-in end of the mixing screw,
the screw surface of the mixing screw being continuous and imperforate between the shaft and a peripheral outer edge at a constant radial distance from the shaft,
a radius to said screw surface having an angle of inclination relative to a plane perpendicular to the lengthwise direc-

tion of said shaft and inclining away from said plane in a direction towards the feed-out end of the mixing screw, the mixing screw having its diameter, pitch, r.p.m. and angle of inclination relative to a horizontal plane so mutually adapted to the volume of the components brought together that said components only partly fill said mixing screw and are imparted a rolling, tumbling movement on their way towards the feed-out end of the mixing screw, thus causing an effective dry mixing of the components.

3,871,629

MOULDABLE SYNTHETIC RESIN COLOURING MATERIAL AND APPLICATION APPARATUS THEREOF

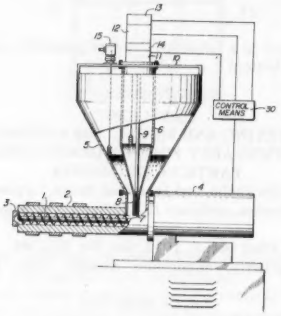
Iwao Hishida, 4-16, Hattoriminamicho-4-chome, Toyonaka, Japan

Filed Apr. 24, 1973, Ser. No. 354,075

Claims priority, application Japan, July 28, 1972, 47-75634; Dec. 28, 1972, 48-3597

Int. Cl. B01f *7/08*

U.S. Cl. 259—191 **5 Claims**



1. An automatic feeder for a resin melting apparatus having main screw means enclosed by a cylinder and heating means surrounding said cylinder for conveying, compressing and melting the resin material fed thereto, comprising first hopper means for feeding a resin material to be melted and second hopper means for feeding a colouring material directly to said main screw means, said second hopper means including a hopper element and a small screw disposed in a colouring material passage formed at the lower end of said hopper element in communication with the cylinder.

3,871,630

APPARATUS FOR SINTERING PRESSED POWDER ELEMENTS CONTAINING HYDROCARBONS

Erwin Wanetzky, and Gerhard Kuklok, both of Gross-Krotzenburg, Germany, assignors to Leybold-Heraeus-Verwaltung GmbH, Cologne-Bayental, Germany

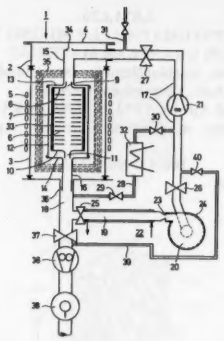
Filed Mar. 12, 1973, Ser. No. 339,976

Claims priority, application Germany, May 5, 1972, 2222050

Int. Cl. F27b *5/04*

U.S. Cl. 266—20 **11 Claims**

1. A vacuum-furnace arrangement for sintering pressed powdered elements containing hydrocarbons under vacuum and elevated temperatures, comprising in combination a vacuum tight furnace housing with heating means; support means within said housing for supporting said elements; first pumping means connected to said housing for producing a vacuum within said housing; separating means for separating said hydrocarbons; cycle of flow interconnecting means between said housing and said separating means; and second pumping means within said cylce of flow interconnecting means for



circulating the furnace atmosphere through the said separating means.

3,871,631

BURNING DEVICE FOR BURNING ORE PELLETS AND SIMILAR BODIES

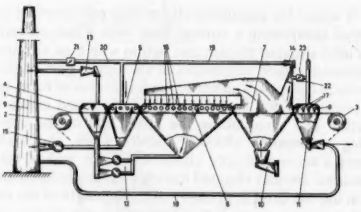
Siewert Gerrit Jan Biewinga, Velsen, Netherlands, assignor to Hoogovens Ijmuiden B.V., Ijmuiden, Netherlands

Filed Nov. 21, 1972, Ser. No. 308,559

Claims priority, application Germany, Nov. 24, 1971, 2158317

Int. Cl. F27b *21/00*

U.S. Cl. 266—21 **4 Claims**

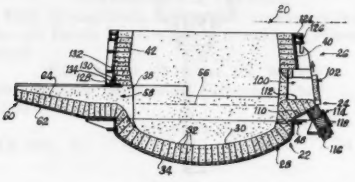


1. A burner device for the baking of ore pellets and the like comprising in sequence, one after the other, at least one drying zone, a burning zone, a first cooling zone, a second cooling zone, a movable grid system for supporting a bed of ore pellets to be baked passing through each of said zones in a longitudinal path, said first cooling zone being connected at one end to said burning zone and drying zone by a passageway extending over said movable grid system, the opposite end of said first cooling zone having means to draw cooling air thereinto for passage upwardly through said movable grid system, said second cooling zone having water distributing means at its upper end thereof for supplying cooling water for passage downwardly through said movable grid system, the opposite end of said second cooling zone having means for carrying off said cooling water after passage through the grid system, said water distributing means being positioned above said movable grid system from a point at a distance of about 15 to 30 percent of the length of said second cooling zone from the entrance end thereof up to close to the exit end thereof.

3,871,632
MODULAR DIVISIBLE BARREL-SHAPED SHELL FOR METALLURGICAL FURNACES

Edgar Wunsche, Oshawa, Ontario, Canada, assignor to Engineered Metal Products Company, Inc., Birmingham, Ala.

Filed Aug. 2, 1972, Ser. No. 277,142
Int. Cl. C21c *5/44*
U.S. Cl. 266—35 **12 Claims**

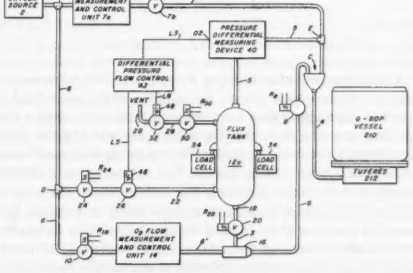


1. A furnace shell for use with molten metal,
comprising a generally dish-shaped bottom section having a metal casing and a refractory lining,
a first generally ring-shaped wall section removably mounted on top of said bottom section and having a metal casing and a refractory lining,
and a second generally ring-shaped wall section removably mounted on top of said first wall section and having a metal casing and a refractory lining,
each of said wall sections having means for supporting the refractory lining thereof when said wall section is dismounted from the furnace shell,
whereby the refractory lining may be installed in each wall section prior to the mounting of the wall section on the furnace shell,
said first wall section having an upper portion with an upward step adjacent one side of said first wall section,
said second wall section having a correspondingly stepped lower portion to mate with the stepped upper portion of said first wall section.

3,871,633
METHOD AND APPARATUS FOR CONTROLLING THE INJECTION OF FLUX INTO A STEELMAKING VESSEL AS A FUNCTION OF PRESSURE DIFFERENTIAL

William A. Kolb, Forest Hills Borough, and Michael J. Papinchak, Plum Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 25, 1973, Ser. No. 354,610
Int. Cl. C21c *5/48*
U.S. Cl. 266—35 **27 Claims**

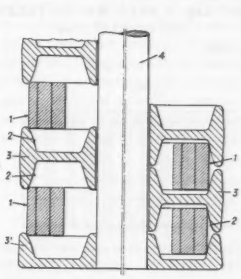


1. In combination with a steelmaking apparatus having a steelmaking vessel, a source of fluid, and a primary fluid flow conduit coupled to said vessel for supplying fluid from said source to said vessel, the invention comprising:
means for injecting flux into said vessel through said primary conduit, which includes,
a. a secondary fluid flow conduit having its output coupled to said primary conduit in an additive manner;
b. a flux-containing tank having its output coupled to said secondary conduit for supplying flux to said secondary conduit;
c. pressurizing means for pressurizing said tank in a controlled manner;
d. differential pressure measuring means for measuring the pressure difference between said primary conduit and said tank; and
e. control means coupled between said pressure measuring means and said pressurizing means for controlling the pressurizing of said tank to thereby control the rate at which flux is supplied to said secondary conduit from said tank as a function of the pressure differential between the pressure in said primary fluid flow conduit and the pressure in said tank.

3,871,634
SPRING ASSEMBLY

Maximilian Russold; Heribert Sidan, and Gerhard Rogen, all of Judenburg, Austria, assignors to Steirische Guszstahlwerke Aktiengesellschaft, Vienna, Austria

Filed Sept. 19, 1973, Ser. No. 398,821
Claims priority, application Switzerland, Mar. 1, 1973, 3160/73
Int. Cl. F16g *7/08*
U.S. Cl. 267—9 B **18 Claims**



1. A spring assembly which has an axis and is adapted to take up and exert a force in the direction of said axis comprising a plurality of resilient rings which are axially stacked in alternation with rigid rings, each of the said resilient rings being arranged between two of said rigid rings, said rigid rings being formed with peripheral sliding surfaces which have generatrices that are inclined to said axis, said resilient rings bearing on said sliding surfaces and being in line contact with said sliding surfaces, each of said resilient rings being a coiled spring which has at least two convolutions, the neighbouring convolutions being in contact with each other at least in the finally compressed state of the spring assembly.

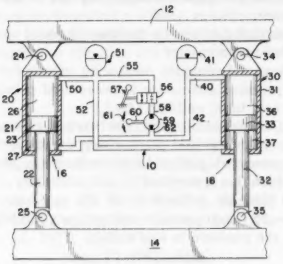
3,871,635
SUSPENSION HYDRAULIC ROLL STABILIZER WITH LEVELING

Dale H. Unruh, Peoria, Ill., and Jan B. Yates, Reynoldsburg, Ohio, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 23, 1974, Ser. No. 435,761
Int. Cl. B60g *21/00*
U.S. Cl. 267—11 **7 Claims**

1. In a vehicle suspension system having hydraulic struts between a sprung mass and its wheeled supports with hydraulic chambers in the struts cross-connected across the vehicle, means for leveling the sprung mass relative to its wheeled support comprising:

a pair of hydraulic conduits extending across the vehicle and cross-connecting the hydraulic chambers of the struts to provide horizontal stability of the sprung mass upon the wheeled support, each conduit and connected chambers providing a separate hydraulic system,



a controllable conduit communicating only with and connecting said hydraulic systems,

a valve controlling fluid flow through said controllable conduit, and

a pump for moving fluid from one hydraulic conduit to the other selectively.

3,871,636

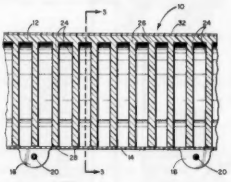
ENERGY ABSORBING DEVICE

Joseph R. Boyle, Rochester, N.H., assignor to McCord Corporation, Detroit, Mich.

Filed Aug. 3, 1971, Ser. No. 168,660

Int. Cl. F16f *1/44*

U.S. Cl. 267—140 **9 Claims**



1. Energy absorbing apparatus comprising: a base member extending laterally across the direction along which an impacting object may be expected to travel towards said apparatus; a flexible covering cooperating with said base member to define an interior chamber, said chamber being subdivided by a plurality of resilient laterally spaced and independent rib members extending between said base member and said covering, the rear edge of at least some of said rib members being immediately adjacent to said base member and the remaining edges being joined to said covering such that said rib members are adapted to temporarily buckle independently of one another upon impact of an object against said covering.

3,871,637

STIRRUP ASSEMBLY FOR EXAMINATION TABLE

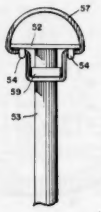
Floyd F. Mueller, Two Rivers; Clarence J. Aulik, and Paul R. Zeman, both of Manitowoc, all of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed July 5, 1973, Ser. No. 376,369

Int. Cl. A61g *13/00*

U.S. Cl. 269—328 **10 Claims**

1. A stirrup assembly for examination tables comprising a foot plate having an upper supporting surface and slot means, means for supporting the plate, retaining strap means extending through the slot means of the foot plate, a portion of the strap means extending below the foot plate, the strap means being movable through the slot means to vary the distance which the strap means extends above the foot-supporting surface of the foot plate, and strap-tightening means slidably mounted on the plate support means below the foot plate for movement toward and away from the foot plate, the strap-



tightening means being engageable with the portion of the strap means below the foot plate which extends through the slot means whereby movement of the strap-tightening means away from the foot plate pulls the strap means through the slot means to reduce the distance which the strap means extends above the foot-supporting surface of the foot plate.

3,871,638

APPARATUS FOR DIVIDING A STREAM OF PRINTED NEWSPAPERS INTO PORTIONS

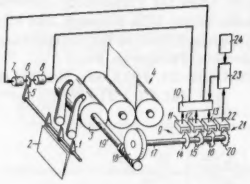
Leonid Pavlovich Grachev, ulitsa Serafimovicha, 2, kv. 181; Nikolai Ivanovich Anikanov, Bolshaya Bronnaya ulitsa, 2/6, kv. 6, both of Moscow; Grigory Iosifovich Zax, ulitsa Mechnikova, 14a, kv. 24, Kiev; Grigory Avramovich Radutsky, 16 Parkovaya ulitsa, 49, korpus 2, kv. 68, Moscow, and Rafail Efimovich Kheifets, Brest-Litovsky prospekt, 162, kv. 30, Kiev, all of U.S.S.R.

Filed May 18, 1973, Ser. No. 361,846

Claims priority, application U.S.S.R., Sept. 12, 1972, 1825045

Int. Cl. B41i *43/00*

U.S. Cl. 270—32 **3 Claims**



1. An apparatus for dividing a stream of printed newspapers into portions which are to be subsequently assembled into batches, said apparatus comprising: a folder drum of a rotary printing press; a deflector for selectively varying the path of the printed newspapers, said deflector being disposed beneath said folder drum; drive means for actuating said deflector between selectable positions thereof; a shaft carrying said folder drum; electric pickup means being responsive to the angle of rotation of said folder drum, said pickup means being electrically connected to said drive means of said deflector for controlling the actuation thereof; said electric pickup means having a rotary master disc drivingly connected with said shaft carrying said folder drum; said rotary master disc having elements being angularly spaced such that the number of said elements correspond to the number of said electric pulses sent to said drive means of said deflector and are equal to the

number of the batches of the newspapers delivered to be assembled during one full revolution of said master disc of said pickup means.

3,871,639
METHOD OF AUTOMATICALLY PRODUCING A CONTINUOUSLY PROCESSABLE MULTICOPY WRITING SURFACE ASSEMBLY, AND APPARATUS FOR PERFORMANCE THEREOF

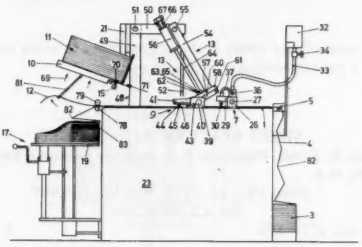
Willi Felix, Strengelbach, Switzerland, assignor to Jos. Hunkeler AG Fabrik Fur Graphische Maschinen, Wikon, Switzerland

Filed Oct. 26, 1972, Ser. No. 301,100

Claims priority, application Switzerland, Nov. 1, 1971, 15912/71

Int. Cl. B65h *39/00*

U.S. Cl. 270—52 **34 Claims**



1. A method of automatically producing a continuously processable assembly including a continuous web and attachments, having a leading edge and a trailing edge, wherein the leading edge of the attachment is connected to the web, comprising:

moving the continuous web in one direction;

moving the leading edge of one of said attachments toward the continuous web from the opposite direction;

accurately stopping the motion of the attachment upon contact with a predetermined portion of the continuous web; and

interconnecting the leading edge of the attachment and the continuous web in an orderly manner.

3,871,640
VARIABLE-MODE ROTARY DUPLICATOR

Gerhard Ritzerfeld, Schorlemer Allee 14, Berlin, Germany

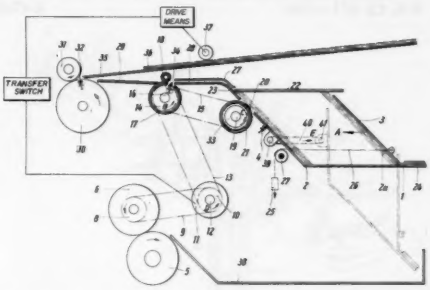
Filed Apr. 12, 1973, Ser. No. 350,465

Claims priority, application Germany, Apr. 20, 1972, 2219939

Int. Cl. B65h *3/44*

U.S. Cl. 271—9 **5 Claims**

1. In a rotary duplicator, a combination comprising a pair of cooperating feeding rollers adapted to receive copy sheets for forwarding of the same to a printing roller; a first supply station for supplying first copy sheets comprising a supply table adapted to contain a stack of said first copy sheets; a second supply station for supplying smaller second copy sheets located below said first supply station comprising a magazine having a first wall provided with an opening and a second wall movable toward said first wall, said magazine being adapted to contain a stack of said second copy sheets standing on edge and inclined into contact with a portion of said first wall so as to overlie said opening therein; first friction roller means located above said first supply station and engaging the uppermost one of said first copy sheets so as to contact and expel from said first supply station said uppermost one of said first copy sheets along a first path to said cooperating feeding rollers; second friction roller means extending through said opening into said magazine so as to contact and expel said second copy sheets consecutively along a second path towards said cooperating feeding rollers; third friction roller means located downstream of said second friction roller means along said second path so as to contact and guide the expelled second copy sheet towards said cooperating feeding rollers; transporting means including first drive means for driving said first friction roller means and second drive means for driving said second and third friction roller means; main control means including main coupling means between said second drive means and said second and third friction roller means and including switch means for actuating said first drive means and



said main coupling means alternately so as to deliver to said cooperating feeding rollers first and second copy sheets alternately; and additional control means including additional coupling means between said second drive means and said second friction roller means and a sensor associated with said third friction roller means for sensing the presence or absence of a second copy sheet along said second path in the region of said third friction roller means and operative for intermittently disengaging said additional coupling means subsequent to engagement of a second copy sheet by said second friction roller means but prior to engagement of the same second copy sheet by said feeding rollers.

3,871,641
SHEET FEEDING DEVICE

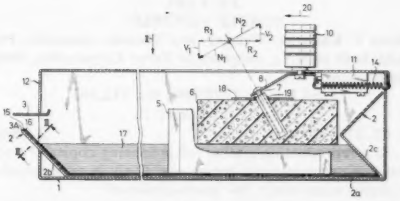
Gerhard Marx, Taunusstein, and Gunter Kramer, Wiesbaden, both of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Jan. 16, 1973, Ser. No. 324,234

Claims priority, application Germany, Jan. 17, 1972, 2202024

Int. Cl. B65h *3/02, 3/52*

U.S. Cl. 271—42 **17 Claims**



1. An apparatus for feeding individual sheets of a stack to a device on which said sheets are further worked comprising a reciprocating conveyor element for the displacement of the top sheet of the stack and a reciprocating telescopic rod comprising a rod and sheath, said conveyor element having a flat bottom of gripping foam which contacts the top sheet of the stack, said telescopic rod being arranged to extend obliquely downwardly and rearwardly with respect to the sheet-

conveying direction and having its sheath fastened to the conveyor element.

3,871,642

SHEET FEEDING ASSEMBLY

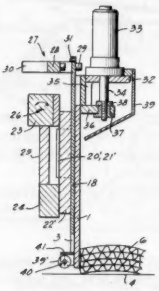
Sady Mariaux, Bournens Roland Golay, Lausanne, both of Switzerland, assignors to J. Bobst & Fils S.A.

Filed Oct. 9, 1973, Ser. No. 404,803

Claims priority, application Switzerland, Oct. 6, 1972, 14678/72

Int. Cl. B65h *3/56*

U.S. Cl. 271—138 **6 Claims**



1. A sheet feeding apparatus for feeding stiff curved sheets one at a time from a vertical stack of such sheets to a line of position in a sheet processing machine comprising: a feed table having a shuttle reciprocably movable in a horizontal plane from a first retracted position to an extended position to carry sheets from said feed table to the feed line of position; an upstanding gauge member initially positionable so as to overlie the plane of said feed table and shuttle a distance greater than the thickness of one sheet to be fed and less than the thickness of two such sheets; said gauge member being located adjacent the leading end of said shuttle and in spaced relation from said line of position; means holding said gauge member in said initial position until said shuttle has carried the leading edge of a sheet beneath said gauge member and thereupon releasing said gauge member for free upward movement above the plane of said shuttle and feed table; whereby said gauge member will ride freely along the upper curved surface of the said sheet being fed to the line of position by said shuttle.

3,871,643

SORTER CONTROL

William P. Kukucka, Webster, and Thomas Acquaviva, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 4, 1972, Ser. No. 312,143

Int. Cl. B65h *31/24*

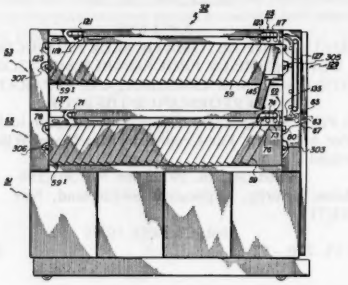
U.S. Cl. 271—173 **3 Claims**

1. In a reproduction system for producing copies of documents and arranging said copies selectively in either stacked or collated relationship, the combination of:

a processor for producing said copies from original documents;

a sorter for arranging said copies in either of said stacked or collated relationships, said sorter having plural copy receiving trays arranged in at least two distinct sections; and,

control means adapted to prevent the start of the reproduction system in the absence of an empty section in said sorter, said control means being adapted to allow the start of the reproduction system when at least one of said sections is empty and direct the copies produced to said empty section, said control means being adapted when



both of said sorter sections are empty to route copies to a predetermined one of said sections.

3,871,644

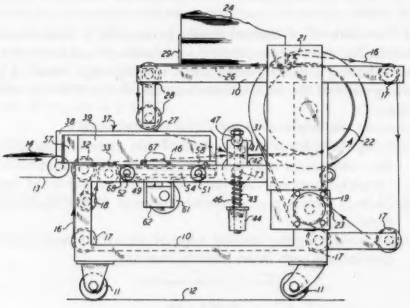
SHEET STACKER WITH JOGGER

Anton R. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed May 23, 1973, Ser. No. 363,067

Int. Cl. B65h *29/14*

U.S. Cl. 271—198 **6 Claims**



1. A sheet stacker with a jogger, for conveying, jogging, and stacking a stream of imbricated flexible sheets, comprising a horizontally disposed sheet conveyor for supporting said stream thereon in a horizontal orientation and including two support portions disposed adjacent each other along the path of said stream and being horizontally spaced apart and with the one of said portions which is downstream from the other of said portions being disposed at an elevation lower than the elevation of said other portion to have said portions present a gap therebetween for passing said stream across said gap and from one of said portions to the other of said portions and to thereby permit said stream of sheets to curve in its said path of flow and about a line extending across said stream and downwardly across said gap and thereby cause said sheets to stiffen in the directions parallel to said line, a plate pivotally disposed adjacent the side of said stream and extending adjacent the location of the bend in said stream and being movable into and out of contact with the edges of said stiffened sheets adjacent said plate for jogging said sheets into alignment with each other, a pivot mounting for said plate and disposed downstream from the location of said gap and relative to the stream movement of said sheets for greater pivotal movement of said plate at its extent adjacent said gap than at the pivot location on said plate, oscillating mechanism connected to

said plate for inducing the pivoting of said plate, and a stacker platform disposed adjacent said conveyor and downstream from said plate for receiving the aligned said sheets when the latter move off said conveyor.

3,871,645

DRIVING DEVICE FOR INTERMITTENTLY REVOLVING FEEDING CYLINDER IN PRINTING AND PAPER PROCESSING MACHINES

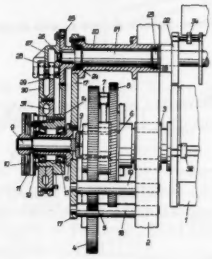
Artur Buttner, Heidelberg, and Hugo Rambausek, Wiesloch, both of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed May 18, 1973, Ser. No. 361,463

Claims priority, application Germany, May 18, 1972, 2224210

Int. Cl. B65h *5/12*

U.S. Cl. 271—270 **1 Claim**



1. Drive means for a printing and paper processing machine of the type having an intermittently revolving sheet feeding cylinder and a single revolution cylinder comprising a flange bushing, an elongated journal pin for the single revolution cylinder, an extension of said journal pin mounted for radial movement of its axis inside said flange bushing, two cam discs mounted on said flange bushing and adapted to control acceleration, delay and stoppage phases of the feeding cylinder, an elongated shaft for the feeding cylinder, a roller support member firmly connected to said feeding cylinder shaft, two rollers journalled on said roller support member, said rollers being in form-locking rolling engagement with said cam discs during said phases of the feeding cylinder, toothed segment means for effecting accurate coincidence of further rotation of the feeding cylinder with that of the single revolution cylinder, said toothed segment means being intermittently meshingly engageable with a gear secured to said elongated shaft of the feeding cylinder, said sheet feeding cylinder and said toothed segment means being rotatably mounted on the frame of said machine, said cam discs and said toothed segment means being separated from said journal pin extension and mounted on said flange bushing connected to the machine frame, and coupling means connected to said journal pin extension for transmitting rotation of said single revolution cylinder to said cam discs and said toothed segment means, said coupling means being adapted to accommodate said radial movement of said journal pin extension.

3,871,646

EXERCISE APPARATUS

Robert W. Slack, 635 Sycamore St., Decatur, Ga. 30030

Filed Feb. 26, 1973, Ser. No. 335,578

Int. Cl. A63b *21/00, 23/00;* **G09b** *15/06*

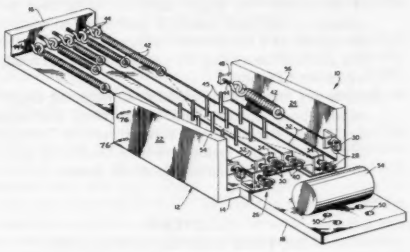
U.S. Cl. 272—67 **9 Claims**

1. In an exercise device:

a. a base having finger exercise members mounted thereon,

b. each of said finger exercise members comprising a finger portion into which a finger is inserted, a resilient means actuated by said finger and a connecting member connecting said finger member to said resilient means,

c. upstanding sides on opposite sides of said base and each of said sides being inclined whereby said base may be inverted to incline said finger members and raise same above the level of a support surface whereby the hand may be inverted to a palm-down position and the finger member actuated in this position, and a platform including means to support the limb of a user when said device is being used in the upright base position, said base being movably mounted on said base to be swung out of the way when using said device in the inverted base position.



8. In an exercise device:

a. a base having a hand and wrist exercise device for attachment thereto,

b. said hand and wrist exercise device comprising a frame attached to said base, said frame having support members positioned at the top of said frame and on opposite sides thereof and a hand member resiliently mounted thereon,

c. said hand member being suspended on opposite ends thereof on said frame by a plurality of resilient members, said resilient members each being connected to a different position on said support members, and

d. a removable arm support positionable on said base for use to support the arm while operating the hand member with the hand.

3,871,647

ADJUSTABLE HEIGHT BASEBALL BATTER DUMMY

Arturo O. Tellez, 96 Gila St., Morenci, Ariz. 85540

Filed Aug. 30, 1974, Ser. No. 502,219

Int. Cl. A63b *69/40*

U.S. Cl. 273—26 A **4 Claims**

1. A baseball batter dummy simulating a real batter's stance comprising:

a rigid upper torso body portion containing the batter's chest, arms, hands, and head;

a middle body portion containing the batter's waist and lower portion of the chest and the pair of leg portions through the knee thereof;

a pair of rigid leg and foot portions each associated with one of the leg projections of the middle body portion and telescopically received relative thereto;

the body upper torso portion being telescopically received through the top of the middle body portion;

a stake projecting vertically from each of the feet portions adapted to be inserted into the ground to retain the batter in a batting stance adjacent a plate for pitching practice purposes;

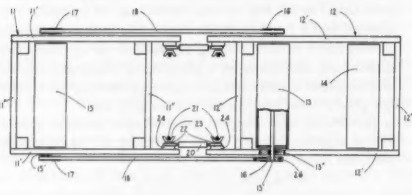
pressure clips disposed in the finger portions of each hand of the batter, the finger portions being thus movable relative to the rigid thumb of each hand to wrap around the handle of a bat to removably retain a bat in the hand in a position simulating the position of the bat ready to hit a pitched ball; and

an adjusting mechanism extending through the upper torso, middle body portion, and leg portions and adjustably connecting the same together to provide for telescopic adjustment of the various portions relative to each other to vary the height and stance of the batter.

3,871,648
BICYCLE TRAVEL SIMULATOR

Robert A. Maurer, III, 140 E. Gorham St., Madison, Wis. 53703

Filed July 20, 1973, Ser. No. 381,146
Int. Cl. A63b *69/16*
U.S. Cl. 272—73 **5 Claims**



1. In a bicycle travel simulator wherein frame supported bearing mounted rollers are provided upon which a bicycle can be ridden in place with a front wheel support roller being belt driven by a rear wheel support roller, an improvement comprising in combination,

a. at least one peripheral groove unitary with each belt connected wheel support roller adapted to receive a power transmission belt wherein each said groove is wider at the mouth thereof than at the root,

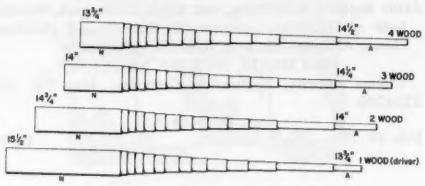
b. at least one substantially non-extensible endless power transmission belt of greater minimum width than the roots of said grooves operably disposed in said grooves supported wedgelike by the walls of said grooves radially distant from the roots of said grooves, said belt being structured to be compressed deeper within the grooves to substantially increase the operating frictional losses between the wall of said grooves and said belt when the spacing between said wheel support rollers is increased,

c. first adjustment means anchorably connectible in incremental settings to said frame to adjustably space said belt connected wheel support rollers in accordance to the wheel base of a bicycle to be ridden thereon and second adjustment means biasable to variably tension said belt and the depth to which said belt is drawn into said grooves thereby to provide fine adjustment of the frictional loading between said belt and walls of said grooves and of the work expended in pedaling a bicycle thereon, to simulate the effort required to pedal a bicycle under conditions of actual bicycle travel.

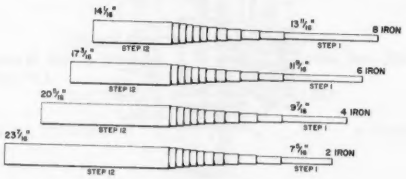
3,871,649
MATCHED SET OF GOLF CLUBS

John Arthur Kilshaw, Netherton, England, assignor to The Dunlop Company Limited, London, England

Filed Oct. 2, 1969, Ser. No. 863,181
Claims priority, application United Kingdom, Oct. 4, 1968, 47175/68
Int. Cl. A63b *53/00*
U.S. Cl. 273—77 A **9 Claims**



VARYING LENGTHS OF SECTIONS A & N FOR WOODS 1 – 4



REPRESENTATIVE SHAFTS FOR A SET OF IRONS

1. A matched set of golf clubs having woods and irons, each club of said set comprising a shaft having a club head on one end and a grip on the opposite end and said set comprising a plurality of woods of decreasing shaft length and increasing loft and a plurality of irons of decreasing shaft length and increasing loft, the improvement comprising having the flexural rigidity of the shaft of any wood in the set not greater than that of the shaft of any longer wood in the set and having the flexural rigidity of the shaft of any iron in said set not greater than that of the shaft of any longer iron in said set.

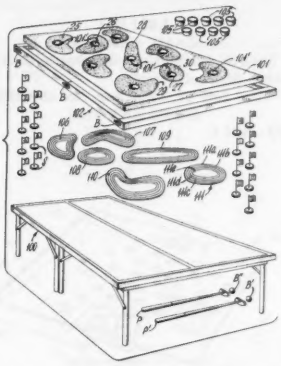
3,871,650
GAME APPARATUS

William J. Casey, 3204 Colony Club Rd., Pompano Beach, Fla. 32506

Continuation-in-part of Ser. No. 112,169, Feb. 3, 1971, abandoned, Continuation-in-part of Ser. No. 881,553, Dec. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 826,807, May 22, 1969, abandoned. This application June 8, 1973, Ser. No. 368,138
Int. Cl. A63f *7/06*
U.S. Cl. 273—87 R **7 Claims**

1. Golf game apparatus comprising a table defining a generally horizontal playing area surface spaced vertically from a surface on which said table is supported, flexible blanket means freely laying on and being removable from said playing area surface and for simulating a golf playing area on the upper surface of said blanket, said blanket means having a plurality of holes therein each constituting means for defining a target hole into which a ball can be propelled, said blanket means being otherwise continuous, flexible means defining at least one mound for insertion beneath said blanket means and constituting means for flexing said blanket means generally only in the areas thereabove under the weight of said blanket means, said last mentioned means constituting a plurality of flexible layer means for disposition one upon the other and being freely movable between said blanket means and said playing area surface for variably changing the contour of the

upper surface of said blanket means; and a putting cue comprising a shaft and a head the head having a flat ball striking



surface lying in a plane normal to the axis of the shaft, whereby said cue is constituted as ball striking means for use by a player standing on the surface supporting said table.

3,871,651

TIP CAT APPARATUS INCLUDING ELEVATED TEE

Mary E. Garcia, 3635 North 155th Terrace, Basehor, Kans. 66007, and Sophie A. Piekarski, 2024 Orville Ave., Kansas City, Kans. 66102

Filed May 2, 1974, Ser. No. 466,181

Int. Cl. A63b 71/02

U.S. Cl. 273—95 F **1 Claim**

1. A game apparatus for play by one or more individuals on a lawn area and the like, the apparatus comprising, in combination;

a playing stick of an elongated solid cylindrical configuration including cylindrical side wall surfaces, a flat top end, and a flat bottom end, said top and bottom ends disposed parallel to each other and normal to the axis of said playing stick, said stick having a diameter of about one inch and an overall length of about 3 inches;

a batting stick of a solid elongated cylindrical rod configuration formed into a handle portion at the top end thereof adapted to be gripped between the hands of an individual for use of the batting stick, and a striking portion formed integrally on the bottom end portion thereof, said batting stick having a flat top end extending normal to the axis of the batting stick, said batting stick having a bottom end disposed in aligned contact edge extending normal to the axis of the stick offset from the axis of the stick and disposed normal to and including the tangential line extending longitudinally along the side wall surface of the stick;

said striking portion of said batting stick being of an incline tapered flat surface which tapers upwardly from said bottom end in a direction toward said top end at an angle from about 12° to about 15° and terminates at a tangential line extending longitudinally of the side walls diametrically opposed to the tangential line contacting said stick bottom end, the width of said striking surface as measured at the axis of said batting stick being equal to the width of said striking surface as measured at bottom end; said batting stick having a diameter of about 2 inches and an overall length of about 14 inches as measured between said top end and said bottom end thereof;

a table consisting of a flat horizontally disposed top member and four independent identically configured vertically extending leg members adapted to support said top member at a vertical elevation spaced from the ground on which the table is supported;

said top member being square in configuration and having a horizontal flat top surface, a horizontal flat bottom surface, a pair of opposed parallel side edges, and opposed front and back edges;

an opening disposed centrally of said top member and extending completely therethrough between said top and bottom surfaces thereof, said opening being of a diameter less than the length of said playing stick;

a pair of diametrically opposed recesses disposed along the axis of the top member intersecting the midpoints of said opposite side edges, each of said recesses being of an identical semi-circular configuration and defined in said top member top surface adjacent perimeter portions of said opening such that the recesses open into said opening to be contiguous therewith, the overall length as measured between the diametrically opposed outermost surfaces of said recesses being greater than the overall length of said playing stick with said playing stick adapted to be restingly received along the axis of said opening with the ends of said playing stick restingly received in opposite ones of said recesses;

a plurality of vertically extending socket forming recesses, each of said sockets disposed in said top member bottom surface adjacent each of said corners thereof and extending vertically thereinto and opening out of said bottom surface;

each of said leg members being of an identical elongated rectangularly shaped configuration having a rectangular cross-section, a flat top end extending normal to the axis of the leg member, and a bottom end;

each of said bottom ends of said leg member being tapered to a point adapted to assist in the penetration of the lawn surface on which said table is supported for firm supporting of said table in position thereon; and

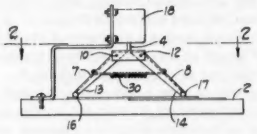
a plurality of axially elongated solid cylindrical peg members, each peg member having a bottom end and a top end, each peg member associated with one of said top ends of said leg members with said peg bottom end affixed centrally thereof to be axially aligned with the axis of said leg member, said peg projecting upwardly therefrom in a vertical direction and adapted to be removably engaged in associated one of said sockets of said table member, said socket being of a size and configuration complementary to the size and configuration of said peg, the pegs detachably affixing each of said leg members to a corner portion of said top member with said top end of each leg member disposed in juxtaposition with said top member bottom surface when said peg is fully engaged in said recess;

whereby said table top may be rapidly assembled to said legs and said playing stick having its ends restingly supported in said recesses to extend diametrically across said opening for batting with said striking portion of said batting stick.

3,871,652
RANDOM SELECTOR SWITCH AND GAME

Donald R. Schreier, 2007 Grandee Ct., Apt. A, Belpre, Ohio 45714

Filed Sept. 20, 1972, Ser. No. 290,716
Int. Cl. A63f 7/06
U.S. Cl. 273—94 R 18 Claims

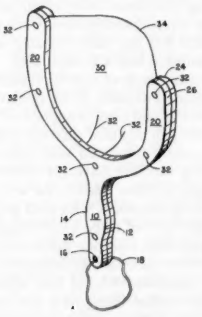


1. A random selector comprising a base, shaft means having an axis extending perpendicular to said base, said shaft means being mounted for rotation about its axis, and means to drive said shaft means at at least a predetermined speed, a pair of diametrically spaced arms, means hingedly supporting said arms on said shaft means for pivoting about an axis lying in a plane transverse of said shaft means axis, said arms being of length greater than the distance between said hinge means and said base, said arms having ends which engage said base when said shaft means is at rest, at least two indicia on said base and disposed to be in position to underly said arm ends when said arm ends engage said base, said arms extending angularly outwardly, relative to said shaft means, and means enabling and causing said arms to move out of contact with said base when said shaft means is rotated at said predetermined speed.

3,871,653
POCKETED CATCHER AND PROJECTOR

Wilbert Gus Sambos, 150 S. Rancho Santa Fe Rd., San Marcus, Calif. 92069

Filed July 9, 1973, Ser. No. 350,072
Int. Cl. A63b 71/02
U.S. Cl. 273—96 R 11 Claims



1. An article of sports equipment for catching and throwing a ball comprising:

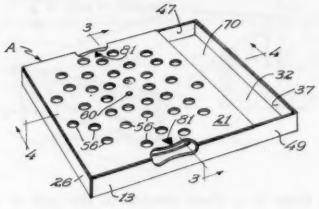
a. A body having a handle and two arms extending from one end of the handle in bifurcated, generally semi-annular configuration, and their outer ends being parallel, and

b. a sheet of flexible material positioned between said arms and handle end and attached thereto, the sheet being wider and longer than the bifurcation so as to extend to one side of the plane of said arms thereby forming a scoop-like pocket which extends from said one end of said handle along said arms and between them to catch a ball.

3,871,654
GAME CARTON

Robert A. Bliss, St. Paul, Minn., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed July 17, 1974, Ser. No. 489,258
Int. Cl. A63f 3/00
U.S. Cl. 273—136 C 8 Claims



1. A game structure including:

a carton having a rectangular bottom panel,

side walls of equal height extending upwardly from opposite sides of said bottom panel,

a top panel hinged to the upper edge of one of said side walls,

an outer side wall hingedly connected to the side of said top panel,

means connecting said walls and panels in tubular relation,

a top panel liner panel secured to one of said side walls and underlying said top panel,

flanges hinged to two opposed edges of said top panel liner panel and extending downwardly therefrom into engagement with said bottom panel, and

said top panel having apertures therethrough adapted to accomodate game pieces adapted to rest upon said top panel liner panel.

3,871,655
CONVERTIBLE GAME TABLE ASSEMBLY

Melvin Zimmers, Westport, and Gary A. Gerber, Weston, both of Conn., assignors to Coleco Industries, Inc., Hartford, Conn.

Filed Aug. 8, 1973, Ser. No. 386,599
Int. Cl. A63d 15/04
U.S. Cl. 273—123 R 21 Claims

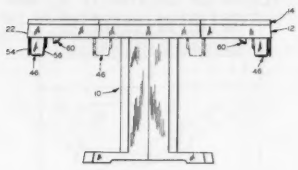
14. In a convertible game table, the combination comprising:

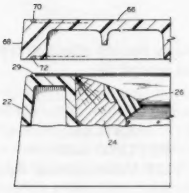
a. a base;

b. a first table top member having a periphery and a central portion, said table top member also having at least one aperture extending downwardly therethrough adjacent the periphery thereof and track means on the lower surface thereof adjacent said aperture and extending from adjacent said aperture towards the middle of said first table top member and terminating at a point adjacent the central portion of said table top member;

c. receptacle means slidably seated in said track means for movement between a first position adjacent said aperture and the periphery of said table top member to receive an object falling through said aperture and a second position wherein the outermost edge of said receptacle means is spaced substantially inwardly from said aperture and the periphery of said first table top member and is adjacent the central portion of said table top member to avoid interference with the legs of persons seated about said table;

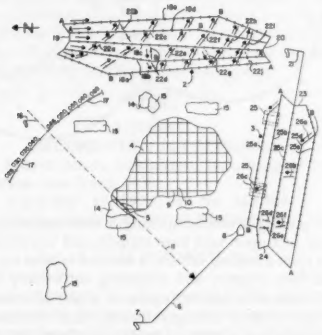
d. means mounting said first table top member on said base; and





e. a second table top member overlying and removably seated upon said first table top member.

3,871,656
SAILING GAME APPARATUS
Jerry N. Selness, 1718 Shady Grove, Bossier City, La. 71010
Filed Dec. 2, 1971, Ser. No. 203,970
Int. Cl. A63f *3/00*
U.S. Cl. 273—131 B **3 Claims**



1. A sailing game for use with playing pieces simulating sailing vessels comprising:

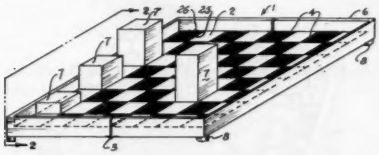
a. A grid having alternate windward position marks, intersecting starboard and port tack lines, compass bearings, and an arrow indicating wind direction inscribed thereon;

b. A transparent overplay positioned over said grid and having a leeward mark starting point and a windward mark finishing point inscribed thereon, said leeward mark starting point and said windward mark finishing point being positioned essentially across said grid from each other;

c. Said grid being mounted for pivoting with respect to said overlay to vary coincidence of said alternate windward position marks and said windward mark to effect a simulated change in wind direction; and

d. Playing pieces adapted to sequentially traverse said grid along said starboard and port tack lines at a predetermined rate from said leeward mark starting point to said windward mark finishing point.

3,871,657
MULTILEVEL CHESS OR CHECKER BOARD
Marilyn J. Lorenz, 4188 Lockport Dr., Bridgeton, Mo. 63044, and Michael B. Larson, 6672G Peachtree Industrial Blvd., Doraville, Ga. 30340
Filed Mar. 20, 1974, Ser. No. 453,097
Int. Cl. A63f *3/02*
U.S. Cl. 273—131 AD **5 Claims**

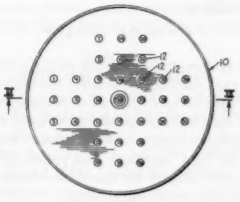


5. A checkerboard for playing a game, comprising:

a playing surface, said playing surface including a layered construction including a first layer having an outer surface, said outer surface having a plurality of alternately colored squares displayed thereon, said squares being arranged in a checkerboard design, each of said squares having a length dimension and a width dimension, a second layer permitting attachment of a plurality of supporting pieces, and a third structural layer;

a peripheral lip extending around said playing surface; and a plurality of supporting pieces for varying the topography of said playing surface, said supporting pieces having length and width dimensions corresponding to the length and width dimensions of individual ones of said squares, said supporting pieces including means for removably mounting individual ones of said supporting pieces on said playing surface, equal numbers of individual elements of said supporting piece plurality having heights of one-half inch, 1 inch, 1½ inches and 2 inches.

3,871,658
BOARD GAME APPARATUS
Milton C. Shaw, Bronx, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Aug. 28, 1974, Ser. No. 501,334
Int. Cl. A63f *3/00*
U.S. Cl. 273—133 **3 Claims**



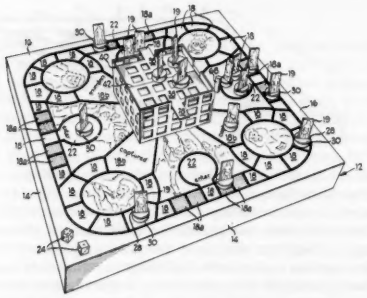
1. A plurality of generally cylindrical playing pieces, a game board having defined thereon one central position, a matrix of other positions disposed about said central position, each

position being defined by round hole dimension for snug fitting engagement with each of said playing pieces, each position having a switch disposed therein, said switch in said central position being normally open and all other switches being normally closed, an electrical power source, a bell, and wiring connecting all of said switches, the electrical power source and said bell in series.

3,871,659
BOARD GAME APPARATUS

Jeffrey D. Breslow, Highland Park; Gordon A. Barlow, Skokie; Joseph M. Burck, Chicago, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed May 9, 1974, Ser. No. 468,516
Int. Cl. A63f *3/00*
U.S. Cl. 273—134 AD **11 Claims**



1. In a board-type game apparatus including a gameboard having a playing surface with a plurality of stations defining at least one path of travel, a plurality of playing pieces positionable on said gameboard and movable over the playing surface along said path of travel, and means for determining the movement of the playing pieces, the improvement comprising: means defining a holding station on the gameboard at which at least one playing piece is positionable, means defining a receiving area for receiving at least one playing piece, and manually manipulatable randomly operable actuating means operatively associated between said holding station and said receiving area for moving a playing piece therebetween only during certain actuations of the actuating means as determined by the random operation thereof.

3,871,660
WORD GAME APPARATUS

Ardie Victor Estes, 4305 Kinglet, Houston, Tex. 77035

Filed Jan. 21, 1974, Ser. No. 434,852
Int. Cl. A63f *3/00*
U.S. Cl. 273—135 D **4 Claims**

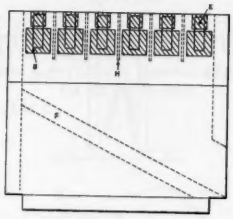
1. A recreational and educational game apparatus comprising:

a plural set of congruent, indicia bearing tiles,

a retaining rack adapted to display the elements of a plural subset of said set of tiles in an ordered array wherein said elements may be so disposed as to have the sequence of their respective indicia convey information,

a plurality of first identical and independently operable retaining and display means each capable of releasably and replacably receiving a single element of said set of said tiles whereby a plurality of said tiles, when simultaneously received by said first means may define said array.

independently operable replacement means associated with each of said first means whereby operational engagement of a second said tile with any of said first means which already contains a first tile causes ejection of only said first tile from said array and retention of said second tile

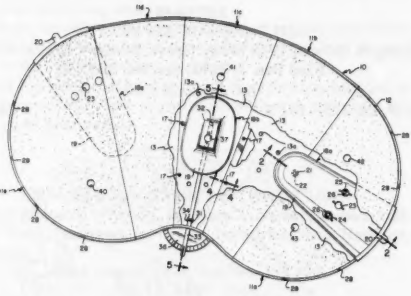


by said first means thereby effecting replacement of said first tile by said second tile.

3,871,661
PUTTING GREEN

William S. Korff, 9215 Valley Stream Rd., Clarence, N.N.Y. 14031

Filed Oct. 6, 1972, Ser. No. 295,704
Int. Cl. A63b *69/36*
U.S. Cl. 273—178 B **8 Claims**

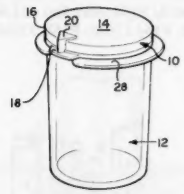


1. A putting green comprising a base support, a layer of artificial turf upon said base support and coextensive therewith to form a putting surface, a bumper around the perimeter of said base support and extending sufficiently above said putting surface to prevent egress of a golf ball therefrom, at least one contour changer means, each contour changer means including a contour body, said body being disposed between said base support and said layer of artificial turf for imparting a contour to said putting surface, and handle means connected to said contour body and extending away from said putting surface for moving said contour body to different positions relative to said putting surface, at least one opening in said layer of artificial turf disposed in cooperative relation with each contour changer means each contour body similarly having at least one opening and each of said openings being registerable when said contour body is moved to one of said different positions to jointly define a cup, and plug means for closing at least one of said openings when said openings are not in registry with each other.

3,871,662
CHILD-RESISTANT CLOSURE

K. Kevin Hepp, Perrysburg, and James H. Price, Maumee, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 11, 1974, Ser. No. 432,527
Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*
U.S. Cl. 215—223 **8 Claims**



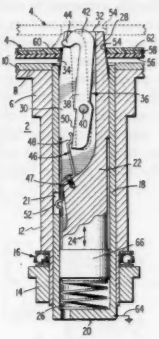
1. A child-resistant closure and container combination comprising a flexible closure member having a top portion and a depending peripherally continuous wall portion, the wall portion having an interior surface, the interior surface having a pair of inwardly projecting locking lugs of dissimilar configuration and an inwardly projecting camming lug thereon, one of said locking lugs having a first configuration and the other of said locking lugs having a second configuration, said pair of locking lugs being of limited annular extent and contained within a separate semicircular span of the interior surface of said closure wall portion from said camming lug, and a container having a mouth portion, the mouth having an outwardly projecting retaining rib adjacent an upper end thereof, said retaining rib being substantially continuous with a pair of slots of dissimilar configuration formed therein, one of said slots having a first configuration of sufficient size to allow said one locking lug to pass through said rib and the other of said slots having a second configuration of sufficient size to allow said other locking lug to pass through said rib, said locking lugs and said camming lug engaging the lower surface of said retaining rib upon application of the closure to the container to hold the closure on the container, and said locking lug preventing removal of said closure from said container except when said one locking lug is positioned adjacent said one slot and said other lug is positioned adjacent said other slot.

3,871,663
RECORD CONTACT SPINDLE

Frederick Roland Stave, Oaklandon, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,545
Claims priority, application United Kingdom, Apr. 19, 1972, 18044/72
Int. Cl. G11b *9/06;* **H05f** *3/02*
U.S. Cl. 274—10 S **12 Claims**

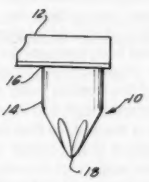
1. A playback system for disc records of the type having a centrally apertured major surface comprising exposed conductive material in the vicinity of the aperture and susceptible to accumulating an electric charge of sufficient magnitude to damage a pickup device for transducing said record comprising: a rotatable turntable and a record centering spindle mounted for rotation with said rotatable turntable, a conductive member mounted in said spindle for movement between (1) a first position sufficiently withdrawn within said spindle to permit record passage to a playback position centered about said spindle and supported by said turntable, and (2) a second position extending sufficiently from said spindle to permit electrical contact between said member and the exposed conductive material of a major surface of a record when said record is disposed in said playback position with said turntable in supporting contact with a surface of said record opposite to said major surface, and means coupling said conductive member through said spindle to a point of reference potential for said playback system.



3,871,664
PHONOGRAPH STYLUS

George F. Hughes, Williston Park, N.Y., assignor to Diamagnetics, Inc., Freeport, N.Y.

Filed May 29, 1973, Ser. No. 364,829
Int. Cl. G11b *3/44*
U.S. Cl. 274—38 **4 Claims**



1. A phonograph stylus for use with a transducer for transposing mechanical variations on the opposed walls of the grooves of a phonograph record into electrical signals comprising: an elongated body portion having a mounting portion at one end and an active portion tapering to a tip opposite said one end, said tip being defined by the intersection of four convex faces, wherein two of said faces intersect to form a first curved edge which when engaged with a record is substantially tangent to one of the walls of said groove over a major portion of its length and the remaining two of said faces intersect to form a second curved edge substantially tangent to the other of the walls of said groove over a major portion of its length.

3,871,665
ROD WIPER ASSEMBLY

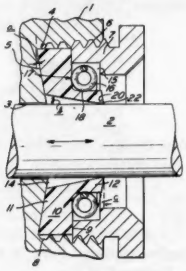
John A. Burke, Rocky River, Ohio, and Thorval L. Berg, Warminster, Pa., assignors to Greene, Tweed & Co., Inc., North Wales, Pa.

Filed Apr. 9, 1973, Ser. No. 349,353
Int. Cl. F16j *15/00;* **E21b** *33/08*
U.S. Cl. 277—24 **9 Claims**

1. A piston rod wiper assembly arranged for circumferential contact of a wiper element of said assembly with a reciprocating piston rod comprising:

a housing having a first central axis opening through which the piston rod is adapted to reciprocate, said housing being further provided with a concentric cavity at its

outer end of greater diameter than that of said first central opening, thus forming an inner rear wall for said cavity; an annular wiper element formed of rigid, durable plastic material, fixedly arranged in said cavity; said wiper element having a body portion and an integral lip portion of reduced diameter extending axially from the body portion and having an internal circumferential face continuous with that of said body portion and an outer circumferential face intersecting the forward wall of said body portion; an annular retaining collar attached to the housing with the inner face of the collar contacting the forward wall of the body portion of said element to press the rear wall of the body portion into abutment with the



rear wall of said cavity thereby forming a static seal; said retaining collar further having a flange extending radially inward toward said lip portion, thereby forming a channel between said flange and said wiper element; spring means in said channel surrounding the outer circumferential face of at least part of said lip portion adjacent its intersection with said body portion, the central opening in the annular wiper element being frusto-conical with the major diameter of the frustum being greater than that of the rod passing therethrough and its minor diameter slightly less than that of the rod, so that only the tip of the lip of the wiper element is in contact with the rod while the remaining inner surface of the wiper element slopes progressively away from said rod surface.

3,871,666
SHAFT PACKING

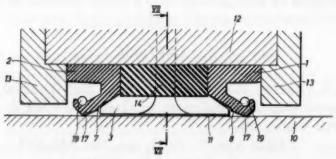
Dietmar Franz, Lampertheim; Willi Schoneberger, Wiesbaden, and Gerd Upper, Unterflockenbach, all of Germany, assignors to Firma Carl Freduenburg, Weinheim, Germany

Filed Mar. 5, 1973, Ser. No. 338,192

Claims priority, application Germany, Mar. 3, 1972, 2210209

Int. Cl. F16j *15/32*

U.S. Cl. 277—59 **8 Claims**



1. A shaft packing comprising two lip type sealing elements of a rubber-elastic material, a damming component between said two sealing elements, said damming component reducing free space between a shaft and the sealing elements over part of the shaft periphery to a slit which substantially blocks oil from flowing therethrough, and an oil passage at the remaining circumference at both ends of the damming component, the passage traversed by the oil providing a free space and being so shaped that laminar flow will reliably occur for a given shaft speed.

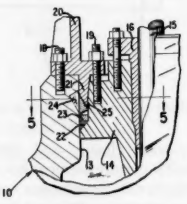
3,871,667
PRESSURE SEALED BONNET PACKING RING

Bruce Thompson, Wethersfield, Conn., assignor to Ametek, Inc., New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,048

Int. Cl. F16j *15/06*; **F16k** *31/50*

U.S. Cl. 277—115 **3 Claims**



1. In a valve, the combination of a valve chamber having an opening therein, a bonnet positioned in said opening and defining a space between said bonnet and the wall of said opening, said bonnet having an annular portion thereon defining a shoulder within said space, there being a triangular sectioned annular groove in the wall of said opening above said bonnet shoulder, an annular packing ring within said space upon said bonnet shoulder, and means for mounting said bonnet within said opening and having an annular projection thereon extending into said space to urge the upper portion of the packing ring into said triangular shaped annular groove.

3,871,668
VACUUM SEALS

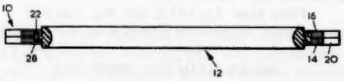
John Norman Coker, 21 Scallows Close, Three Bridges, Sussex, and Basil Dixon Power, 3 Mount Close, Pound Hill, Sussex, both of England

Filed Aug. 2, 1973, Ser. No. 385,082

Claims priority, application Great Britain, Aug. 4, 1972, 36639/72

Int. Cl. F16j *15/00*

U.S. Cl. 277—180 **4 Claims**



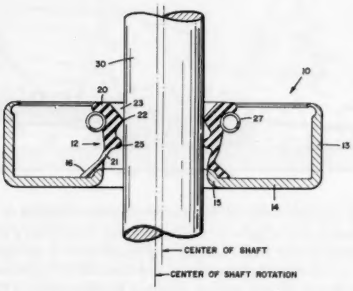
1. A vacuum sealing member comprising a continuous carrier ring of rigid material and a sealing ring of elastomeric material, said carrier ring comprising a pair of substantially identical continuous separable complementary half carriers mutually abutting face to face and each half carrier including in radial section a continuous groove, the two grooves together forming in radial section a T-shaped recess in the carrier ring, said sealing ring having sealing surfaces extending beyond the aggregate thickness of said half carriers and including means extending radially outwardly therefrom in the diametric plane defining an annular flange of complementary radial section to the recess in the carrier ring to secure the sealing ring when the two carrier halves are brought together in mutual abutment and latching means integral with said half

carriers for aligning and joining the two half carriers with respect to each other.

3,871,669
ROTARY SHAFT SEAL WITH SHAFT RUNOUT PROTECTION

James A. Repella, Madison Heights, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed June 14, 1973, Ser. No. 369,974
Int. Cl. F16j *15/32*
U.S. Cl. 277—182 5 Claims



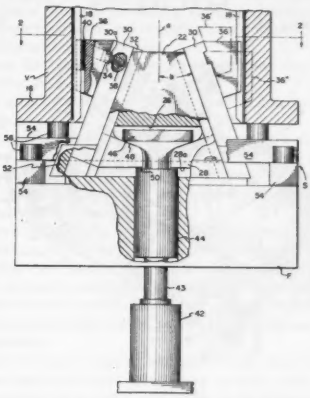
1. A shaft seal including in combination:
a rigid case having an anchor portion,
an elastomeric member having an anchor portion bonded to the anchor portion of said case and having a lip body, said lip body being joined to said anchor portion of said elastomeric member through a thin flexing section which is thinner than said body, and comprises a relatively short frustoconical shell,
said lip body including a sealing lip with an edge and a pair of surfaces meeting at said edge, one siad surface on the air side of the seal and one said surface on the oil side of said seal, the surface on said air side having an annular radially inwardly-extending projection spaced axially from said seal lip and terminating at a normally larger radius than said seal lip and not normally in engagement with a shaft during operation and serving to stablize said seal lip during extreme runout conditions, said projection being an integral portion of said lip body.

3,871,670
CHUCK APPARATUS FOR CLAMPING VARIED SIZED WORKPIECES TO BE MACHINED

Dale W. Wright, Saginaw, Mich., assignor to Miles Machinery Company, Saginaw, Mich.

Filed Aug. 24, 1973, Ser. No. 391,286
Int. Cl. B23b *31/40*
U.S. Cl. 279—2 R 6 Claims

2. A chuck assembly for clamping workpieces comprising varied sized tubular valve bodies including:
work support means including an axially extending chuck body, with front and rear ends;
jaw carrying members mounted on said body for advancing and return movement axially and radially;
jaw mounting surfaces on said members near the front ends thereof;
a replaceable jaw having an axially extending side surface, fixed on each of said surfaces to project radially a predetermined distance;
power operated means engaging said jaw mounting members for moving the members to grip and release a valve body; and
said work support means incorporating a rest and clamp member body of variable axial height to synchronize with the radial projection of the jaws, comprised of stacked rest and clamp members mounted one atop the other in interfitted relationship to receive said valve body, and

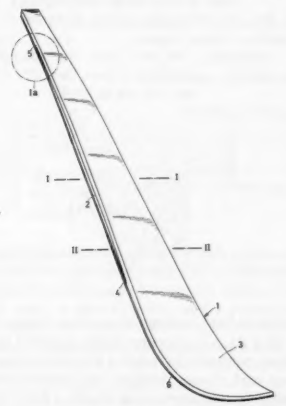


against which said jaws clamp said valve body when said power operated means moves said jaw mounting members in a direction to grip the valve body.

3,871,671
RADIAL SKI HAVING A PROFILED RUNNING SURFACE

Heinz Bildner, Traunsteiner Strasse 57, 8221 Seebruck, Germany

Filed June 4, 1973, Ser. No. 366,615
Claims priority, application Germany, June 8, 1972, 2227980; Feb. 27, 1973, 2309782
Int. Cl. A63c *5/04*
U.S. Cl. 280—11.13 E 10 Claims

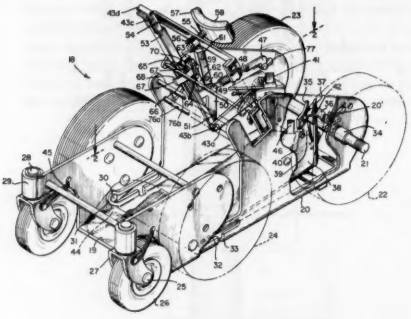


1. A ski having a profiled running surface which is symmetric to the longitudinal axis of the ski and defined at both sides by edges of wear-resistant material, characterized in that at least one guide strip is provided at each side of the ski forming a further edge projecting laterally over an edge of wear-resistant material, in that each said guide strip extends in excess of one-half the longitudinal length of the ski, and in that each said guide strip has its lateral projection diminished continuously from the middle of the ski towards the tip end and tail end thereof.

3,871,672
WALKING-ROLLERSKATE DEVICE

Andrew Bardy, 235 E. 73rd St., New York, N.Y. 10021

Filed May 18, 1973, Ser. No. 361,502
Int. Cl. A63c *17/20*
U.S. Cl. 280—11.21 10 Claims

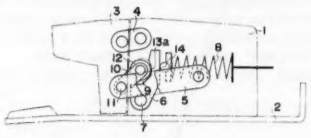


1. A walking-skate device comprising in combination: a platform means divided into fore and aft portions; and a hinge means pivotably connecting the fore portion to the aft portion including rear wheel means mounted revolvably and supportedly on a rearward portion of the aft portion; each of foreportion rearward and forward wheel means mounted respectively at rearward and forward portions of the fore portion supportedly and revolvably thereon, at least one of the foreportion forward and rearward wheel means being pivotable about an upright axis; including toe-shoe-structure-securing means for retaining the fore portion onto a toe-shoe structure; and a rearward securing means for securing the rearward platform portion to a rearward portion of a shoe structure.

3,871,673
SKI BOOT HEEL BINDING

Masahiro Murata, Matsudo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1973, Ser. No. 426,026
Claims priority, application Japan, Dec. 25, 1972, 48-272
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 T 4 Claims

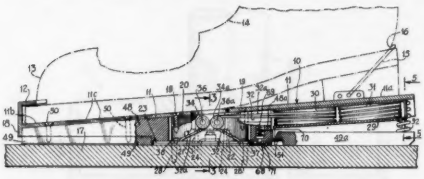


1. A ski boot heel binding comprising a base adapted to be attached to a ski, a supporting block mounted on said base, a jaw member moveable between a boot heel engaging position and a boot heel release position, link means connecting said jaw member to said supporting block, a lever pivotally connected at its lower end to said supporting block, said lever having a longitudinally extending concave surface formed in its front face, a compression spring acting on the back face of said lever and resiliently biasing said lever forward, a rolling link pivotally connected at its front end to the lower portion of said jaw member, a roll connected to the rear end of said rolling link and contacting the upper portion of said concave surface when said lever is in the boot heel engaging position, said compression spring biasing said jaw member in the boot heel engaging position, said roll adapted to move down said concave surface of said lever against the spring force of said compression spring to a point below the dynamic production of said compression spring when said jaw member moves from the boot heel engaging position to the boot heel release position.

3,871,674
SKI SAFETY DEVICE

Thomas C. Bunn, Jr., 42 Southport Woods Dr., Southport, Conn. 06490

Filed June 3, 1974, Ser. No. 475,751
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 N 27 Claims

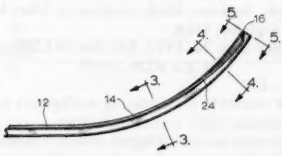


1. A ski safety device for minimizing transmission of injurious forces to a skier's legs by providing controlled excursion of a skier's foot from normal alignment with a ski upon the occurrence of predetermined rotational and lifting forces, said device being an assemblage adapted for mounting at the foot engaging portion of a ski and comprising an elongated tread portion having means at the forward and rear ends thereof for firmly clamping a ski boot thereto, a mounting plate for securing to the ski having upwardly projecting means interfitting with coacting means centrally of said tread portion in a manner to permit rotary movement and lifting movement of the tread portion with respect to said mounting plate, and said tread portion and mounting plate being joined together by tensioned strands extending from anchor points on said mounting plate radially and circumferentially spaced with respect to said upwardly projecting means through guide means at the sides of said tread portion above said mounting plate to tensioning means longitudinally spaced from said mounting plate.

3,871,675
SNOWMOBILE SKI

Jerome E. Lund, Thief River Falls, Minn., assignor to Arctic Enterprises, Inc.,, Thief River Falls, Minn.

Filed Jan. 5, 1973, Ser. No. 321,120
Int. Cl. B62m *27/02*
U.S. Cl. 280—28 7 Claims

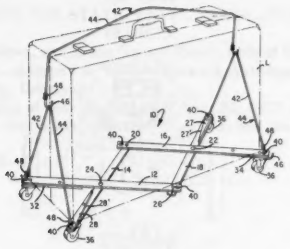


1. A snowmobile ski configured to reduce or eliminate the spraying of snow backwards onto occupants of a snowmobile and comprising an elongated body having a generally straight portion for riding upon the snow, an upwardly curved forward portion terminating in a leading tip, and opposed transversely extending longitudinal edges, the transverse edges solely on the upwardly curved forward portion of the ski having portions depending laterally downwardly near said leading tip to deflect snow away from occupants of said snowmobile when said snowmobile is in motion.

3,871,676
PORTABLE LUGGAGE OR LOAD CARRIER

Charles J. Renard, 356 Vincent Pl., and Louis L. Rifken, 344 Vincent Pl., both of Elgin, Ill. 60120

Filed Feb. 1, 1974, Ser. No. 438,871
Int. Cl. B62d *21/14*
U.S. Cl. 280—35 **6 Claims**

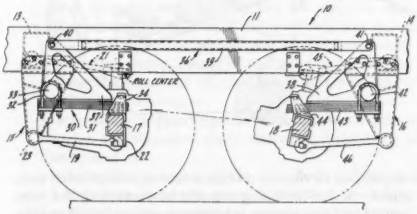


1. A portable luggage carrier comprising at least four interconnected links pivotally connected, with each link pivotally connected to another link intermediate the opposite ends and also pivotally connected to another link adjacent their ends so that said interconnected links form a lazy-tongs type of linkage arrangement whereby said links may be pivoted to an extended elongated luggage carrying position or to a retracted no-luggage carrying position where the links are pivoted to lie adjacent and substantially contiguous to each other, a roller or caster secured to the outer ends of each of said links whereby the luggage carrier may be rolled or wheeled on a floor or ground surface with the luggage supported thereon, said links having means associated therewith whereby the top portions of the links are on the same horizontal plane so that the bottom of the luggage rests flat on the interconnected links, the outermost ends of each of said links having means to which straps are secured, which straps are secured to the luggage to retain the luggage on said luggage carrier while the carrier is rolled on a floor or ground surface.

3,871,677
HEAVY DUTY TRUCK SUSPENSION

Wallace J. Blank, and Thomas H. Watson, both of Oshkosh, Wis., assignors to Oshkosh Truck Company, Oshkosh, Wis.

Filed Oct. 4, 1971, Ser. No. 186,296
Int. Cl. B60g *11/20*
U.S. Cl. 280—104.5 A **16 Claims**



1. A suspension for a tandem axle system, said suspension including

a pair of support members for each axle connected to a base structure,

the pair of support members associated with each axle being connected to said base structure outside the axle span,

first torque transmitting members connecting each axle, below its axis, to its associated support members,

second torque transmitting members connecting each axle, above its axis, to the base structure,

said torque transmitting members being constructed and arranged to substantially eliminate axle hop,

a vertical force transmitting member connected to each support member and engaging an associated axle in force transmitting relationship,

means for transmitting forces imposed on one axle to another axle,

said means for transmitting forces from axle to axle including

a first lever member pivotally connected to a support member and associated with said vertical force transmitting member in such fashion as to be progressively rotated in a given direction upon progressive imposition of vertical forces on the axle,

a force transmitting member pivotally connected at one end portion to the aforesaid first lever member and, at the other end portion thereof, to a second lever member,

said second lever member being associated with the other axle in the tandem axle system in substantially the same functional relationship as the afore-described first lever member,

whereby forces causing rotation of one lever member are transmitted to said other lever member, and

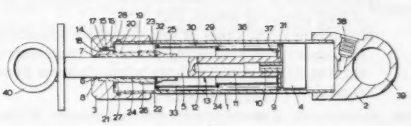
means for varying the ratio of force distribution from axle to axle,

said varying means including means for connecting each end portion of the force transmitting member to its associated lever member at selected radial distances from the point of rotation of each lever member about its associated support member.

3,871,678
SUSPENSION UNITS FOR VEHICLES

Philip Augustus Taft, and Stuart Bruce Dawson, both of Solihull, England, assignors to Girling Limited, Birmingham, England

Filed Nov. 15, 1973, Ser. No. 416,204
Claims priority, application United Kingdom, Dec. 2, 1972, 55776/72; Apr. 5, 1973, 16235/73
Int. Cl. B60g *11/28*
U.S. Cl. 280—124 F **10 Claims**



1. An hydro-pneumatic suspension unit of the self-levelling type for a vehicle comprising a cylinder, a closure for one end of said cylinder, a piston-rod assembly defined by a piston adapted to work in said cylinder, and a piston-rod carrying said piston and adapted to work through said closure, a pressure chamber containing gas for supporting a load on the unit, an inlet for connection to a source of high pressure liquid, an inlet valve incorporated in said closure for controlling liquid flow through said inlet into the unit, means for maintaining the effective length of the unit at a predetermined value irrespective of the load, resilient means acting in association with said piston-rod assembly to control operation of said inlet valve, and a collapsible sub-assembly incorporating said resilient means to limit the maximum effective length which said resilient means can attain, said sub-assembly being engageable with said inlet valve to close said inlet valve when the effective length of said unit attains a predetermined extended value, further extension of said unit beyond the said extended value being opposed by said resilient means after collapse of said sub-assembly.

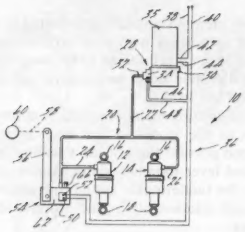
3,871,679
VEHICLE LEVELING SYSTEM

Johan H. Keijzer, Hasselt; Louis J. Jossa, Truiden; Herman E. A. Renders, Diepenbeek, and Alexandru Oancea, Zepperen, all of Belgium, assignors to Monroe Belgium N.V., Sint-Truiden, Germany

Filed June 14, 1973, Ser. No. 370,169

Int. Cl. B60g *11/56, 17/00*

U.S. Cl. 280—124 F **12 Claims**



1. In combination with a leveling system for a vehicle having sprung and unsprung portions, at least one air pressure operated leveling strut for varying the attitude between the sprung and unsprung vehicle portions, an electrically energized air compressor for supplying pressurized air to said strut, first circuit means for communicating pressurized air between the compressor and the strut, second circuit means for communicating electrical energy to the compressor from a source thereof, the improvement which comprises,

a leveling valve responsive to orientation of the sprung vehicle portion below some predetermined position for completing the second circuit means and thereby energizing the compressor, and responsive to orientation of the sprung vehicle portion above some predetermined position for communicating said first circuit means with a relatively lower pressure condition, said valve comprising

a valve housing defining first and second chambers,

an oscillatable actuating shaft journaled in said body and extending into each of said chambers,

actuating means secured to said shaft in each of said chambers,

switch means in one of said chambers actuatable by one of said actuating means, and

valve means in the other of said chambers actuatable by the other of said actuating means for communicating the first circuit means with the relatively lower pressure condition.

3,871,680
VEHICLE SUSPENSION SYSTEM

Naganori Ito, and Hiroshi Aikawa, both of Tokyo, Japan, assignors to Nissen Motor Company, Limited, Yokohama, Japan

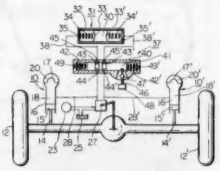
Filed Mar. 22, 1973, Ser. No. 343,965

Claims priority, application Japan, Mar. 27, 1972, 47-29702

Int. Cl. B60g *17/04*

U.S. Cl. 280—124 F **21 Claims**

1. In a vehicle suspension system of the strut type, comprising first and second suspension struts having cylinders formed therein with fluid chambers filled with pressurized fluid and pistons slidably accommodated in said cylinders and provided with piston rods, hydropneumatic spring means connected to said cylinders and having gas chambers, and levelling means having a fluid pump fed from a fluid reservoir to pump fluid under pressure through at least one levelling valve responsive to the vehicle level and arranged to communicate with said fluid reservoir and first and second suspension struts to automatically maintain the effective lengths of said suspension struts constant independently of the load of the vehicle; the improvement comprising accumulator means having two auxiliary fluid chambers and at least one auxiliary gas chamber formed therebetween; normally open valve means connected to and between the two auxiliary fluid chambers and the respective fluid chambers of said first and second suspension struts; and sensor means for sensing a horizontal component of force exerted on the vehicle said sensor means being operatively connected to said valve means to close said valve means to isolate said two auxiliary fluid chambers of said accumulator means from said respective fluid chambers of said first and second suspension struts in response to exertion of said horizontal component of force being sensed, in which the accumulator means includes a cylinder, two pistons slidably mounted within the cylinder, and two spring members for urging the respective pistons away from each other, the auxiliary gas chamber being defined between the two pistons.



3,871,681
VEHICLE SUSPENSION DEVICE CAPABLE OF CORRECTING THE TRIM OF THE VEHICLE

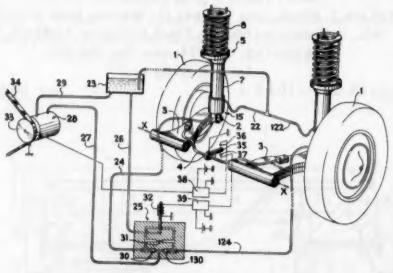
Daniel Piniot, Saint-Germain, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Jan. 7, 1974, Ser. No. 431,309

Claims priority, application France, Jan. 31, 1973, 73.03342

Int. Cl. B60g *3/00*

U.S. Cl. 280—124 F **9 Claims**



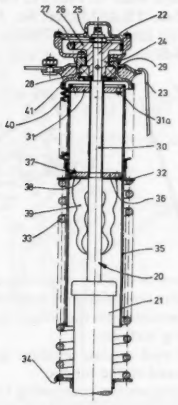
1. A suspension device for a vehicle having a suspended part and a wheel, the device being capable of correcting the trim of the vehicle and comprising at least one suspending-damping assembly having a coil spring and a hydraulic damper interposed between the suspended part and the wheel of the vehicle and at least one trim-correcting cylinder device comprising a cylinder defining a chamber having an end and a piston movable in the chamber of the cylinder toward the end of the chamber, means for supplying pressurized fluid to said chamber between said piston and said end of said chamber, the cylinder device being arranged in series with the hydraulic damper between the suspended part and the wheel, the

damper having a cylinder which terminates short of said end of said chamber and is movable toward said end of said chamber and carries the piston of the cylinder device, which piston extends across substantially the entire section of said chamber so as to be exposed to said pressurized fluid substantially throughout the section of said chamber.

3,871,682
APPARATUS FOR STATIC LEVEL REGULATION OF A VEHICLE

Peter Kirschner, and Heinz Gunter Rauer, both of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of Ser. No. 285,082, Aug. 30, 1973, Pat. No. 3,829,119. This application Dec. 26, 1973, Ser. No. 428,082
Int. Cl. B60g *17/00*
U.S. Cl. 280—124 F **19 Claims**



1. Apparatus for static level regulation of a vehicle having a body, an axle, spring means arranged between the body and the axle, and shock absorber means including a cylinder, a piston positioned within the cylinder, a piston rod mounted on the piston, and two thrust bearings, a different one of the two thrust bearings being mounted on the piston rod adjacent one end of the spring means and on the cylinder adjacent the other end of the spring means, respectively, said apparatus comprising:

a. screw means including a threaded shaft that is formed as a part of the end of the piston rod away from the piston and threaded receiving means arranged to engage the threaded shaft so that a relative rotation between the threaded receiving means and the threaded shaft causes a relative displacement of the threaded receiving means along the length of the threaded shaft, said screw means being self-locking;

b. means for supporting the threaded shaft disposed between the threaded shaft and one of the body and the axle; and

c. driving means engaging the threaded shaft and including

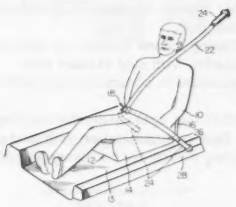
i. detecting means to sense a variation in loading of the vehicle and to provide an output representative of the variation, and

ii. motor means receiving the output and translating it into rotating motion of the threaded shaft so that a change in distance between the body and the one of the two thrust bearings disposed closer to the axle due to variations in vehicle load is accompanied by an oppositely directed compensating change in distance between the one of the two thrust bearings disposed closer to the screw means and the one of the body and the axle adjacent said one of the two thrust bearings closer to the screw means.

3,871,683
VEHICLE SAFETY BELT TIGHTENER

Syuichi Otani, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama City, Japan

Filed Jan. 23, 1974, Ser. No. 435,992
Claims priority, application Japan, Jan. 24, 1973, 48-10430
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 SB **3 Claims**

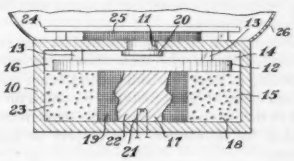


1. A safety belt tightener of a vehicle adapted to tighten a safety belt in the event of a collision or sudden deceleration of said vehicle, comprising a hollow member having formed therein a chamber closed at one end thereof and a slot, said slot extending parallel with a longitudinal axis, said hollow member being connected at the other end thereof to said safety belt, a casing fit in said chamber of said hollow member in such a manner that said hollow member is slidable relative to said casing and having an open end opposite to said closed end of said hollow member, a bracket extending from said casing through said slot and fixedly fastened to a stationary part of said vehicle, said hollow member having a first position in which said one end of said hollow member rather than the other end thereof is adjacent to said casing and a second position in which said other end of said hollow member rather than said one end thereof is adjacent to said casing and movable between said first and second positions, and a pressurized gas producer accommodated in said casing and responsive to an impact for producing pressurized gas to move said hollow member from said first position to said second position.

3,871,684
GAS GENERATOR

Gerald R. Staudacher, Bay City; Thomas E. Dergazarian, and George A. Lane, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 168,234, Aug. 2, 1971, abandoned. This application July 31, 1972, Ser. No. 276,397
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **13 Claims**



1. A gas generator apparatus comprising:

a. a hollow container having a cover member,

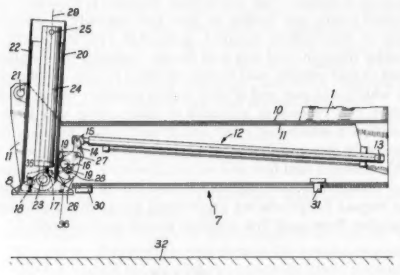
b. a perforated screen, and
c. a baffle plate,
the perforated screen and baffle plate being disposed within the container, the baffle plate forming, with the container, first and second compartments, the first compartment being smaller than the second, the perforated screen being disposed within the second compartment to divide the same into
a first chamber for receiving a solid pyrotechnic and
a second chamber, in fluid communication with said first compartment via a restricted passageway, for receiving means for cooling, within said second chamber, a gaseous reaction product generated from said pyrotechnic,
said cover member having means for securing said cover to said container and having an exhaust port located therein,
d. a frangible closure member in sealed relationship with said exhaust port,
e. a gas diffusing means exterior to said container and in communication with said exhaust port,
f. an ignition means in communication with said first chamber, and
g. an inflatable bag operatively surrounding said diffusing means in fluid communication with said exhaust port via said diffusing means, for receiving an effluent gas therefrom.

3,871,685

DEVICE FOR STATILIZATION OF AN APPLIANCE

Bernard C. Senelet, Ciry-le-Noble, France, assignors to Societe Anonyme dite: Potain Poclaim Materiel, Montceau-Les-Mines, France

Filed Jan. 16, 1974, Ser. No. 433,797
Claims priority, application France, Jan. 18, 1973, 73.01789
Int. Cl. B60s *9/12*
U.S. Cl. 280—150.5 **7 Claims**



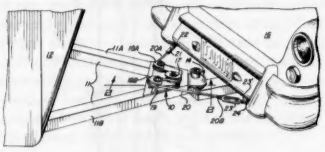
1. A device for stabilization of an appliance on a support surface and having a chassis comprising:
a. at least one telescopic beam having at least first and second beam elements; said first beam element being adapted to be coupled to the chassis and said second beam element being slidably mounted for movement with respect to said first beam element;
b. first means for adjusting the releative position of said first and second beam elements, said first adjusting means being operatively connected between said first and second beam elements;
c. a telescopic arm pivotally mounted on said second beam element for pivotal movément about a horizontal axis and comprising at least first and second beam elements; said first arm element being pivotally mounted on said second beam element and said second arm element being slidably mounted for movement with respect to said first arm element;
d. second means for adjusting the relative position of said first and second arm elements, said second adjusting means being operatively connected between said first and second arm elements; one of said arm elements having a free end positioned adjacent the support surface upon actuation of said second adjusting means;
e. a stabilization support pivotally mounted at the free end of said one arm element; and
f. third means for adjusting the relative angular position of said first arm element with respect to said second beam element; said third adjusting means being operatively connected between said first arm element and said second beam element for moving said telescopic arm between first and second extreme angular positions of adjustment corresponding to orientations of the direction of telescopic sliding movement of said arm which are respectively substantially vertical and inclined with respect to the vertical in the sense of movement of the free end of said second arm element away from the chassis.

3,871,686

TRAILER SWAY CONTROL DEVICE

William L. Rendessy, 8028 N. 14th Pl., Phoenix, Ariz. 85020

Filed June 12, 1973, Ser. No. 369,263
Int. Cl. B60d *7/00*
U.S. Cl. 280—446 B **26 Claims**



1. A sway control device for mounting on the tongue of a vehicle towed trailer comprising in combination:
guiding means mounted on the tongue having one or more arcuate guiding surfaces,
at least one of said arcuate guiding surfaces being non-rotatably secured to the tongue,
a flexible operating means comprising first and second end portions and an intermediate portion,
said intermediate portion of said operating means engaging each of said non-rotatably secured arcuate guiding surfaces in a manner to induce frictional dampening thereon, said first and second end portions of said operating means being connectable to a towing vehicle at points spaced equally from the attachment of the towing vehicle to the trailer, and
means for adjusting the tension of said operating means to keep said operating means taut against said non-rotatable arcuate guiding surface for inducing sliding resistance to the movement of said operating means about said non-rotatable arcuate guiding surfaces.

3,871,687

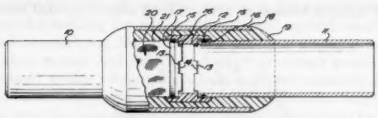
PIPE CONNECTIONS AND CONNECTORS THEREFOR

Basil Frederick Dockree, Welwyn Garden City, England, assignor to Gabine Precision Tubes Limited, Hertfordshire, England

Filed Oct. 3, 1973, Ser. No. 403,046
Claims priority, application United Kingdom, Oct. 6, 1972, 46329/72
Int. Cl. F16l *11/12*
U.S. Cl. 285—53 **10 Claims**

1. A leakproof pipe connection between two pipe lengths arranged end to end comprising an annular ring of electrical insulating material positioned between the pipe ends and maintaining the ends in spaced relation, the ring having annular flanges respectively surrounding the outer peripheral surface of each pipe end, an O-ring seal between said outer peripheral surface of each pipe end and the inner surface of the respective flange of the spacing ring, a casting of electrical insulating material overlapping each flange and extending

beyond each flange to overlap the outer surface of and be in contact with the adjacent length of otherwise exposed pipe, an outer metal sleeve surrounding said casting, anchoring means on at least a part of said outer surface of each said length of

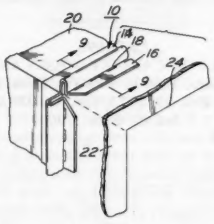


otherwise exposed pipe in contact with the casting precluding longitudinal movement of the respective pipe end relative to the casting, and further anchoring means precluding longitudinal movement of the outer sleeve relative to the casting.

3,871,688
DUCT JOINING MEANS

Angelo R. Molino, 816 E. Bldg., Haddonview Apts., Haddonfield, N.J. 08033

Filed Dec. 26, 1972, Ser. No. 318,005
Int. Cl. F16l *23/00*
U.S. Cl. 285—189 **5 Claims**



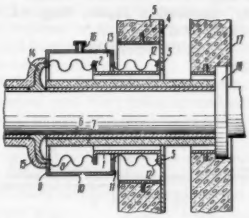
1. In a duct system having a rectangular duct with four sides, each side having a flange and a duct joining member coupling said duct with a body, said duct joining members each comprising an elongated metal strip having an intermediate U-shaped portion with substantially parallel first and second legs and receiving therebetween a respective one of the upstanding flanges at the end of said duct, a first flange extending from the end of the first leg of said U-shaped portion for being positioned over a side at the end of said duct, and a second flange, extending from the end of the second leg of said U-shaped portion received into an opening of said body and being bent for securing same with said body, said second flanges including means permitting ease of bending thereof.

3,871,689
DEVICE FOR SEALING A HIGH-TEMPERATURE CONDUIT

Nikolai Nikolaevich Zaderei, ulitsa Proletarskava, 77, kv. 30; Arnold Serafimovich Nikiforov, ulitsa Pavlovskaya, 90, kv. 60, and Evgeny Petrovich Ushankov, prospekt Obukhovskoi oborony 215, kv. 17, all of Leningrad, U.S.S.R.

Filed Mar. 1, 1973, Ser. No. 337,277
Int. Cl. F16l *5/00, 27/12*
U.S. Cl. 285—189 **2 Claims**

1. A device for sealing a high-temperature conduit in a wall, comprising: a first hollow member and a first corrugated member sealingly interconnected by their ends; and a second hollow member and a second corrugated member sealingly interconnected by their ends, said corrugated members being similar to each other and of the same diameters, and said first and second members being arranged coaxially about each other and about said conduit and forming a closed space around said conduit so that free ends of said first hollow member and said second corrugated member are sealingly connected to said wall and the free ends of said second hollow

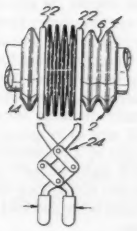


member and said first corrugated member are sealingly connected to said conduit.

3,871,690
PIPE CLAMP

Peter C. Wright, Etobicoke, and Donald L. Kirsch, Toronto, Ontario, both of Canada, assignors to Gidon Industries, Inc., Rexdale, Ontario,, Canada

Filed Dec. 12, 1972, Ser. No. 314,342
Claims priority, application Great Britain, Feb. 28, 1972, 9161/72
Int. Cl. F16l *21/00*
U.S. Cl. 285—226 **7 Claims**



1. Apparatus for clamping a shaft comprising:
a band having a mating fit with said shaft;
corrugations extending axially thereof providing one group of formations constituting peaks on the surface of said band and a second group of formations constituting valleys extending into the interior of said band, the peaks and valleys alternating with each other and the formations of said groups being angularly acute and equal;
a bore defined within said band by said valleys within which said shaft is receivable, said band being axially crushable to collapse the corrugations narrowing the said bore;
compression elements at least one of which is seated in a valley; disposed in confronting relation with at least two said corrugations sandwiched therebetween, and
means for effecting movement of at least one of said compression elements, toward the other to crush and collapse the sandwiched corrugations narrowing the bore of the band to effect a tight grip on said shaft and to clamp it.

3,871,691

PIPE JOINT

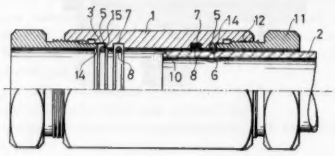
Tatsuya Takagi, No. 6-10 Araebisumachi, and Teruya Takagi, No. 6-4 Araebisumachi, both of Nishinomiya-shi, Japan

Filed Aug. 14, 1973, Ser. No. 388,144

Claims priority, application Japan, Aug. 14, 1972, 47-80801; Sept. 4, 1972, 47-87974

Int. Cl. F16l *39/00*

U.S. Cl. 285—321 4 Claims



1. A pipe joint having a joint body with the inner diameter thereof larger than the outer diameter of a pipe to be joined, which comprises an annular groove formed in the inner circumference of said joint body, a spring lock-ring fitted in said annular groove, said spring lock-ring being, in contour, elliptically shaped in such a manner that the inner diameter of the minor axis is smaller than the outer diameter of the pipe, said spring lock-ring also having a split portion in its circumference, said annular groove in said joint body having from its bottom a diameter greater than the sum of double the thickness of said spring lock-ring and the outer diameter of the pipe, an annular groove formed by rolling in the outer surface of said pipe, said annular groove in said pipe being spaced a predetermined distance from the end of the pipe, said pipe having a tapered outer surface formed at its annular end, wherein, when the pipe is inserted endwise into said joint body, said spring lock-ring is caused to seat in said annular groove in the pipe and dispose the pipe in locking engagement with said joint body and a fastener loosely mounted over the outer surface of the pipe and in threading engagement with said joint body, said fastener having formed at its inside portion a tapered annular inner surface, said joint body having an annular inner shoulder radially extending from its first inside portion having an inner diameter substantially equal to the outer diameter of said pipe to its second inside portion having an inner diameter larger by a predetermined amount than the outer diameter of said pipe, whereby said annular groove is formed for receiving said spring lock-ring by said inner annular shoulder of said joint body and said tapered annular inner surface of said fastener.

3,871,692

KT CONDUIT WITH COMPANION COUPLING

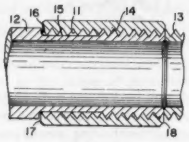
Russell B. Brownfield, 6126 S. Langley Ave., Chicago, Ill. 60637

Filed Feb. 19, 1974, Ser. No. 443,466

Int. Cl. F16l *15/00*

U.S. Cl. 285—390 2 Claims

1. A conduit and companion coupling arrangement for rigid electrical conduit comprising a coupling member having internal threads extending continuously therethrough, and a pair of conduit sections in end-to-end abutting relationship each having a threaded end portion, said coupling member being threaded fully onto one of said conduit sections in an uncoupled position and threaded substantially equally onto both of said conduit sections in a coupled position, said threaded end portions on the conduit sections comprising non-tapered threads and said internal threads in said coupling member being non-tapered, at least one of said conduit sections having a nonthreaded area behind the respective threaded end portions, said nonthreaded area being of less diameter than the outside diameter of said conduit sections and substantially the same as the smallest diameter of said threaded end portions, said nonthreaded area of less diameter providing space for receiving said coupling member in the uncoupled position, and an annular shoulder at the inner end of said nonthreaded area where the area of less diameter joins the outside diameter of such conduit section to act as a limit stop to inward movement of the coupling member, the combined lengths of said threaded end portion and said nonthreaded area on one of said conduit sections being substantially equal to the length of said coupling member and said coupling member in the uncoupled position engages said shoulder at one end of the coupling member and the opposite end thereof is disposed substantially flush with the end of said conduit section.



3,871,693

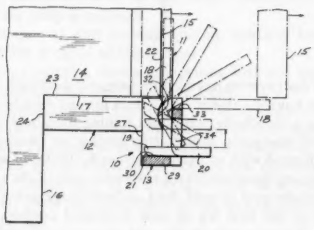
SAFETY LOCK FOR CABINET DOORS AND THE LIKE

William Roger Core, 1610 E. 55th Pl., Tulsa, Okla. 74105

Filed Feb. 23, 1973, Ser. No. 335,244

Int. Cl. E05c *5/00*

U.S. Cl. 292—67 2 Claims



1. A lock for cabinet doors comprising a mounting block, a tee-bar, and a tee-bar retaining block, said combination when attached at the lower edge of a cabinet door holding said tee-bar in inverted configuration secured against rotation perpendicular thereto until said tee-bar is raised in said retaining block by the toe or hand wherein an arcuate opening in said retaining block permits said tee-bar to rotate in response to urging the cabinet door open, said tee-bar then retained in a position 90° away while said door is open, said door during the process of closing bearing against the now vertical crossbar portion causing said tee-bar to turn back to the vertical and fall to the starting, non-rotatable configuration.

3,871,694

DOOR LOCK SAFETY RELEASE MEANS

Clarence E. White, Kenosha, Wis., assignor to White Welding & Mfg. Inc., Kenosha, Wis.

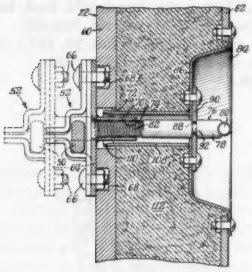
Filed Feb. 1, 1973, Ser. No. 328,859

Int. Cl. E05c *1/04*

U.S. Cl. 293—92 8 Claims

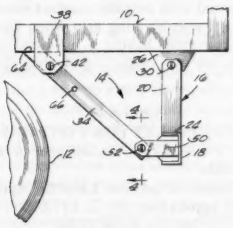
1. For use with an enclosed body having a door frame with upper and lower elements, a door having inner and outer faces and being movable into and out of the door frame between open and closed positions, keeper means mounted on the

upper and lower elements of the door frame, a vertically extending shaft rotatably mounted on the outer face of the door and having radially extending arm portions at the upper and lower ends thereof which are engageable with the keeper means for locking the door in closed position, and a revolvable element connected to the shaft for effecting rotation thereof, the combination of: retainer means at the outer face of the door for holding the revolvable element against rotation and thus maintaining the shaft arm portions engaged with the keeper means and the door locked in closed position; said retainer means comprising a base member normally abutting the outer face of the door, and an axial threaded hub projecting into the door; safety means carried by the door for releas-



ably engaging said retainer means and normally securing the latter to the door; said safety means comprising a rotatable release handle having an axial shank with a threaded portion normally in threaded engagement with said threaded hub, and having a hand grip at the inner face of the door; securing means for preventing axial movement of said release handle in either direction while acommodating rotation thereof; and said release handle being manually rotatable at the inner face of the door for threading said threaded hub outwardly of the door and thereby pushing said retainer means outwardly and away from the door whereby to effect unlocking rotation of the revolvable element and the shaft causing disengagement of the shaft arm portions from the keeper means so that the door may be opened from the inside of the enclosed body.

3,871,695
FOLDING TRUCK BUMPER
Robert W. Koenig, 405 Washington St., Sauk City, Wis. 53583
Filed Feb. 20, 1974, Ser. No. 444,109
Int. Cl. B60r *19/04*
U.S. Cl. 293—73 **5 Claims**



1. A folding bumper for use in connection with an over-the-road vehicle having a frame, the folding bumper comprising, in combination,

a bumper plate assembly,

first hinge means for pivotally connecting the bumper plate assembly to the vehicle frame and defining a generally horizontal pivot axis, said first hinge means supporting said bumper plate assembly for pivotal movement about said pivot axis between a first, generally vertical extended position and a second, generally horizontal collapsed position,

a support arm,

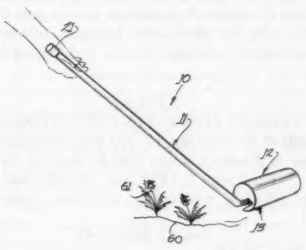
second hinge means spaced horizontally from said first hinge means and defining a generally horizontal pivot axis for said support arm and about which said support arm pivots between an extended and a collapsed position to hold said bumper plate assembly respectively in said first and second positions,

means defining a first hole in said bumper plate assembly and second and third holes spaced along said support arm, said second and third holes being selectively registerable with said first hole, and

pin means releasably receivable in said first, second and third holes and including means for locking said pin means in said registered first and second holes or said first and third holes,

whereby insertion of said pin means in said first and second holes locates and locks said bumper plate assembly in said extended position and said pin means inserted in said first and third holes locks said bumper plate assembly in said collapsed position.

3,871,696
DANDELION PICKER TOOL
Edwin M. Wesley, 2405 Randolph St. N.E., Washington, D.C. 20018
Filed Dec. 28, 1973, Ser. No. 429,113
Int. Cl. A01d *1/00, 45/00*
U.S. Cl. 294—50.6 **1 Claim**



1. A tool for picking dandelions adapted for use by an individual eliminating any bending or stooping of the individual either in the cutting of the dandelion or the recovery of the cut dandelion from the ground, the tool comprising, in combination:

an elongated tubular handle member having a gripping end at a top end thereof and a flattened end at the opposite bottom end thereof, the flattened end being bent at an angle to the axis of the handle member to assume a substantially horizontal plane with the remainder of the handle member projecting upwardly and outwardly therefrom at an angle thereto;

a cylindrically shaped cap adapted to fit over the gripping end of said handle member to close the top end thereof; a hollow elongated rigid cylindrical receptacle having cylindrical side wall surfaces, a closed back end, and an open front end;

a compartment defined interiorly of the receptacle and opening out of the front end thereof;

a V-shaped notch defined in a portion of said receptacle side wall surfaces and having the base portion thereof defined in and contiguous to said receptacle open front end with the apex portion thereof projecting inwardly of the receptacle side wall surfaces in the direction of said receptacle back end, said V-shaped notch including inclined side edges tapering from the base to the apex portion thereof;

the flattened end of said handle being aligned with one of said side edges of said slot and disposed adjacent thereto; a pair of spaced apart apertures disposed in said flattened end;

a pair of similarly aligned and disposed apertures disposed in said receptacle side wall surface adjacent said one side edge of said notch, said apertures of said handle and said receptacle adapted to be placed in alignment with each other;

a bolt associated with each pair of aligned apertures and adapted to pass therethrough;

a nut associated with each terminal end of each bolt and adapted to be threaded thereon to attach said handle to said receptacle with the handle projecting forwardly of the front end of the receptacle;

a single-edged substantially flat razor blade having a cutting edge extending therealong;

an opening provided in said receptacle side wall surfaces adjacent the edge of said notch opposite from the notch edge having the handle secured therealong;

an opening disposed approximately centrally of said razor blade;

the razor blade disposed adjacent the exterior surface of said receptacle side walls with said razor blade opening in alignment with said associated receptacle opening;

a bolt adapted to pass through said aligned openings and be secured therein by a nut to detachably attach said razor blade to said receptacle; and

the razor blade being adjustable on said receptacle for various positions of projecting of said razor blade cutting edge into the open region of said V-shaped notch across the apex portion of said notch in a direction substantially normal to the longitudinal axis of said notch and adapted to slice the stems of dandelions as they pass through said notch with the dandelions being accumulated in said receptacle after being sliced by said cutting edge.

3,871,697

LOAD TAKE-UP APPARATUS FOR LIFTING DEVICES

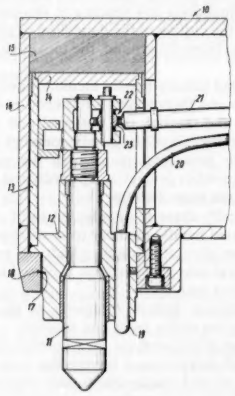
Gert Bechtloff, Brucker Str. 12, 294 Wilhamshaven, Germany, assignor to Friedrick Kocks GmbH, Bremen, Germany

Filed June 7, 1973, Ser. No. 367,940

Claims priority, application Germany, June 8, 1972, 2227823

Int. Cl. B66c *1/42*

U.S. Cl. 294—81 SF **11 Claims**



1. In a shock absorbing load take-up apparatus for containers having a supporting frame and rotatable bolts disposed thereon and adapted to be inserted into corresponding fittings in the container, the improved rotatable bolt mounting comprising:

a. an outer housing attached to said supporting frame,

b. an inner housing attached to said rotatable bolt and coaxially mounted within said outer housing so as to slide relatively thereto in a direction parallel to the longitudinal axis of said outer housing,

c. resilient buffer means interposed between one end of said inner housing and one end of said outer housing, and

d. means to prevent relative rotation between said inner and outer housings.

3,871,698

HOOKING SUSPENSION SYSTEM

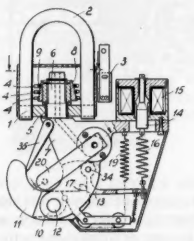
Ludovico Fontana, Via Principe Amedeo 31, Bari, Italy

Filed Dec. 26, 1972, Ser. No. 318,485

Claims priority, application Italy, Jan. 28, 1972, 2106/72

Int. Cl. B66c *1/36;* **H02b** *1/02*

U.S. Cl. 294—83 R **3 Claims**



2. Hooking suspension system for suspending a load which comprises a hooking grip and a hook, said hook comprising a first portion forming one part of an enclosing hook loop, a second portion pivotal with respect to the first portion and forming the remaining part of the enclosing hook loop for engaging the load, an electromagnet connected to said first portion and operably connected to the second portion for opening the hook loop and disengaging the hook from the load, said first portion and said second portion forming a curved trough for bearing the load, the first portion being fixed and the second portion being movable downwardly so as to release the load when moved downwardly; a base having an aperture through which is rotatably mounted the first portion of the hook, said base having suspension means connected to said base, electrical current connecting means fastened to said base, means for conducting the electrical current from the base to the upper portion of the hook, said upper portion of the hook being fitted with movable contact means for engaging a load through said hooking grip when bearing on said hook; said electromagnet having a movable armature connected to said means for conducting electric current.

3,871,699

PLASTIC JACKET FOR CONTAINERS

John D. Hatfield, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

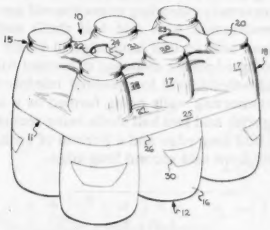
Continuation-in-part of Ser. No. 135,925, April 21, 1971, abandoned. This application Oct. 2, 1972, Ser. No. 294,171

Int. Cl. B65d *71/00*

U.S. Cl. 294—87.2 **23 Claims**

1. An integral one piece molded carrier adapted for engaging and embracing a substantial portion of each of a plurality of containers arranged upright in a substantially side wall abutting relationship comprising an elastomeric material of flat stock thermoformed and having vertically disposed walls defining cell-like compartments whose vertical axes correspond with the axes of said arrangement of plural containers, a horizontal wall integral with all of the vertical walls of said

compartments and connected near the upper end of said compartments, means on said horizontal wall adapted for lifting and supporting the carrier, annularly disposed, radially inwardly projecting yieldable means along the interior surface of said vertical wall of each compartment, the interior diameter across said compartment of said yieldable means being slightly less than the outer diameter of a portion of the container adjacent its upper end to be received in said compartment to engage and support said container therein, a vertical skirt wall adapted to embrace the outer extending side wall portion of said plurality of containers and retain them in a cluster, the skirt wall being integral with said vertical walls of the compartments, and a second horizontal wall below said first mentioned horizontal wall and integral with said vertical skirt wall.



3,871,700

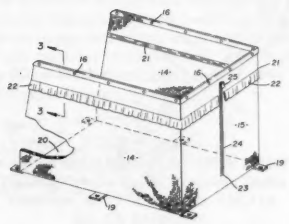
ADD ON ENCLOSURE FOR CAMPERS AND TRAILERS

Merrel F. Brownlee, 58 Euclid Ave., Struthers, Ohio 44471

Filed Sept. 26, 1973, Ser. No. 401,123

Int. Cl. B62c *1/06*

U.S. Cl. 296—26 **2 Claims**



1. An add on enclosure for a trailer having an outwardly extending portion normally overlying a part of a towing vehicle, said add on enclosure consisting of a U-shaped wall means detachably secured to and along the peripheral edge of the lateral sides and the ends of said outwardly extending portion of said trailer and being of a height arranged to extend downwardly from said outwardly extending portion of said trailer to the ground level therebelow so as to enclose the area beneath said outwardly extending portion, and access means in said wall defining means;

said wall means consists of a flexible waterproof sheet material disposed on substantially the same vertical planes as the vertical side and end walls of the outwardly extending portion of the trailer thereabove; said flexible waterproof sheet having at least one horizontal resilient section extending the length of an entire section of said wall means which permits the height of said section of said wall means to be resiliently increased, means for securing the lower edge of said wall means to the ground at spaced points along the lower peripheral edge of each of each of said lateral sides and ends; and wherein said flexible waterproof sheet is detachably secured by separable fasteners which are secured to the peripheral edge of said outwardly extending portion of said trailer and to the upper edge of said wall defining means and the separable fasteners are placed and arranged for mutual engagement.

3,871,701

BABY CARRIAGE

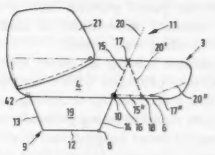
Georg Gesslein, D-8621 Mannsgereuth, Post Beikheim, Kreis Lichtenfels/Oberfranken, Germany

Filed June 12, 1972, Ser. No. 261,674

Claims priority, application Germany, June 14, 1971, 2129449

Int. Cl. B62b *7/12*

U.S. Cl. 296—28 B **20 Claims**



1. A convertible baby carriage for selective use as a flat perambulator or as a stroller, including a carriage body having walls and a bottom which latter can at least partly be lowered, comprising means for varying the overall height at least of one end of said carriage body, including a lowering unit arranged to be moved between the walls of said body, said lowering unit comprising side walls yieldingly connected to said carriage body a plane portion pivotally connected at the bottom of said carriage body for movement about a horizontal hinge, and an angled platform having a bottom portion and an inclined portion attached to said plane portion of said bottom by means of a pivot joint, whereby said angled platform is pivotable around said horizontal hinge between an upper position and a lower position, and a releasable detent for securing said inclined portion of said carriage body in said lower position, whereby said bottom portion remains substantially horizontal in said upper and lower positions.

3,871,702

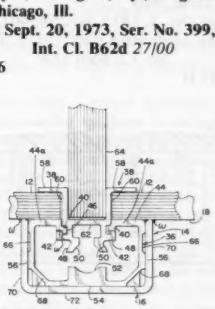
STAKE POST ARRANGEMENT FOR TRAILER

John J. Glassmeyer, Covington, Ky., assignor to Pullman Incorporated, Chicago, Ill.

Filed Sept. 20, 1973, Ser. No. 399,033

Int. Cl. B62d *27/00*

U.S. Cl. 296—36 **8 Claims**



1. In a highway vehicle of the convertible type from flat deck to side wall and tarpaulin roof,

a stake post arrangement comprising a plurality of side stake posts,

each post having an inner post member and an outer post member vertically slidably received in the inner post member in dovetailing fashion to define with the inner post member, panel groove defining walls for receiving vertically extending wall panels to form the sides of the trailer,

each inner post member and each outer post member further together forming a tarpaulin stake receiving pocket, said inner post member being generally hatshaped and having a pair of brim flanges spaced apart from one another and directed outwardly from one another in a longitudinal direction,

said flanges each having its outer longitudinal surface adapted to engage a longitudinally extending panel,

each flange having an outwardly directed transverse panel portion spaced apart from one another and each extending outward from a respective brim flange and adapted to receive between each said transverse portion a transversely extending panel,

each transverse panel portion having a seat portion for limiting outward movement of said associated transversely extending wall panel,

said seat portion having an outer transversely extending flange portion provided with a tarpaulin stake engaging portion and a dovetailing receiving portion,

said outer post member being generally rectangular in shape and having an inner longitudinal portion having inwardly facing panel engaging longitudinal portions defining an opening for extending therethrough the transverse portions of the inner post, said panel engaging longitudinal portions being cooperative with the longitudinal surfaces of the brim flanges of the inner post member forming said groove defining walls,

said inner longitudinal portions of said outer post member further having a pair of dovetailing end portions on each side of said opening slidably receivable in the dovetailing receiving portions of said inner post member,

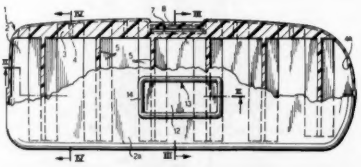
said outer post member further having a pair of laterally extending portions connecting with said inner longitudinal portion and having an outer longitudinal portion connecting with said laterally extending portions, said outer longitudinal portion being provided with a tarpaulin stake engaging portion for complementally forming with the tarpaulin stake engaging portions of the inner post member said tarpaulin stake receiving pocket.

3,871,703

SUN VISOR OF PLASTICS FOR MOTOR VEHICLES AND MANUFACTURING METHOD

Augusto Accatino, Turin, Italy, assignor to Stat S.n.c. di Accatino & C., Turin, Italy

Filed Oct. 2, 1973, Ser. No. 402,691
Claims priority, application Italy, Oct. 5, 1972, 70142/72
Int. Cl. B60j *3/00*
U.S. Cl. 296—97 H **4 Claims**



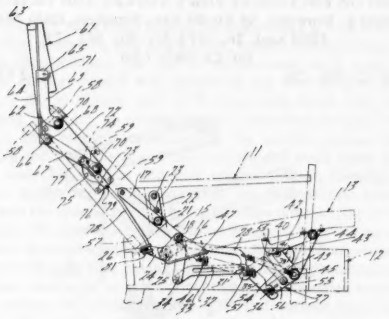
1. A motor vehicle sun visor comprising a unitary substantially flat generally rectangular body of plastic material including two substantially rectangular half shells integrally connected along a first long edge, said shells being symmetrical with respect to a longitudinal middle plane extending substantially parallel to said shells, a longitudinal reinforcing rib extending between said half shells along said first long edge, a plurality of longitudinally spaced sets of connecting walls extending between the opposed inner surfaces of the two half shells, each set of connecting walls being formed by walls which are inclined with respect to said longitudinal middle plane and which mutually intersect along lines situated in said plane parallel to the short edges of said body, said connecting walls extending transversely of the visor from said first long edge into close proximity to the second long edge of said body and comprising a first portion adjacent said first long edge in which the transversely extending edges thereof are of integral one piece construction with said half shells and a second portion adjacent said second long edge in which said transversely extending edges are disposed in contact with said half shells, said half shells, said longitudinal reinforcing rib and said sets of connecting walls being formed as a unitary one piece molding with said two half shells being secured together along said second long edge and a portion of each of the two short edges adjacent said second long edge.

3,871,704

HIGH-LOW BACK FOR CHAIR

Edwin J. Shoemaker, Monroe; Harold P. Ruble, Deerfield, and David B. White, Monroe, all of Mich., assignors to La-Z-Boy Chair Company, Monroe, Mich.

Continuation-in-part of Ser. No. 323,139, Jan. 12, 1973, abandoned. This application May 29, 1973, Ser. No. 364,644
Int. Cl. A74c *1/02*
U.S. Cl. 297—61 **10 Claims**

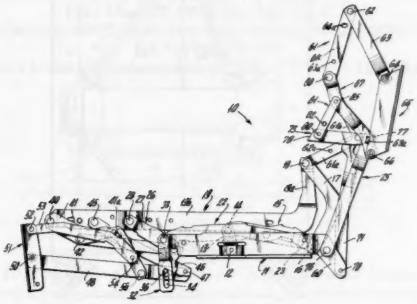


1. In a chair, a base frame, a seat frame, and a back frame, linkage means for interconnecting said back and seat frames for movement relative to each other, said back frame having spaced side members forming a hollow back which is open rearwardly, a back section, upper and lower pairs of links, a pair of plates secured to the inner surfaces of said side members, pivot means securing the upper ends of said pairs of links to said pair of plates and the lower ends to said back section, said pair of plates have an arcuate slot located adjacent to the pivots thereon which support the lower pair of links, said lower pair of links having a longitudinal slot crossing said arcuate slots, operating rods having means at the upper ends projecting through both said slots, and means connecting the lower ends of said operating rods to said seat frame the movement of which relative to the back frame produces the movement of said operating rods to move the back section relative to said back frame.

3,871,705
CHAIR WITH PROJECTING HEADREST AND HARDWARE THEREFOR

Kenneth S. Harrison, Ridgefield Park, N.J., assignor to Mohasco Industries, Inc., Amsterdam, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,801
Int. Cl. A47c 1/02
U.S. Cl. 297—61 15 Claims

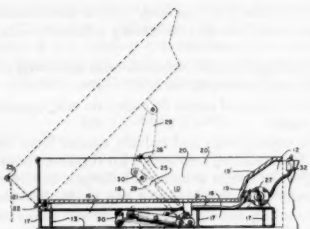


1. Chair hardware, comprising a seat link, a support plate adapted to be fixed to the base of a chair, linkage connecting the seat link to said support plate, a backrest mounting link pivoted to said seat link, a headrest idler link pivoted to said backrest mounting link, a headrest bracket pivotally connected to said idler link, a headrest drive link pivotally connecting said headrest bracket with said backrest mounting link, a headrest bellcrank pivoted mediately the ends thereof, to said backrest mounting link, a connecting link connecting one end of said headrest bellcrank with said headrest drive link, a backrest control link pivoted at its lower end to said support plate and at its upper end to the pivotal connection of said headrest bellcrank to said backrest mounting link, and a headrest actuator link pivoted at its lower end to said support plate and at its upper end of the other end of said headrest bellcrank, said backrest mounting link, said headrest idler link, said headrest bracket and said headrest drive link forming a parallelogram linkage.

3,871,706
SELF-CONTAINED DEMOUNTABLE DUMP BED

Donald M. Odom, Verbena Rt. 3, Meridian, Idaho 83642

Filed Apr. 8, 1974, Ser. No. 458,616
Int. Cl. B60p 1/16
U.S. Cl. 298—1 A 3 Claims



1. A demountable dump bed for truck vehicles having fixed box-type load bodies, comprising;

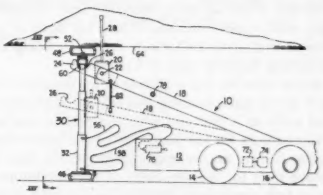
a support frame comprising a pair of rectilinear rails and a plurality of transverse cross-ties;

a tilt body pivotally mounted at its rearwardmost terminal end to the rearwardmost terminal end of said support frame, said tilt body comprising a bottom wall, a front wall issuing upwardly from the rearwardmost terminal end of said bottom wall, a pair of side walls issuing upwardly from the terminal side of said bottom wall and a tailgate pivotally mounted at its uppermost terminal end to the upwardmost rearwardmost terminal ends of said side walls and meeting with said bottom wall; and a lift assembly including lift scissors including a first lever pivotally mounted at one of its terminal ends and disposed rectilinearly with respect to said bottom wall, and a second lever pivotally mounted at one of its terminal ends to the free terminal end of said first lever and being connected by its terminal end opposite that connected to said first lever to a transverse cross-tie disposed centrally in said support frame, including a pressure cylinder pivotally connected at its base to said cross-tie having said lift scissors and being pivotally mounted at its piston head centrally in said first lever, and including a pressure pump mounted at the forwardmost terminal end of said support frame being accommodated by suitable configuration of said tilt body, said hydraulic pump having a valve detachably engageable with said truck box to control said cylinder.

3,871,707
METHOD FOR MINING AND SUPPORTING THE MINE ROOF

Will B. Jamison, Bethel Park, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 286,744, Sept. 6, 1972, abandoned. This application Aug. 23, 1973, Ser. No. 391,032
Int. Cl. E21c 41/00
U.S. Cl. 299—11 8 Claims



1. Method for mining and supporting a mine roof comprising,

dislodging material from the face in a mine entry with a self-propelled mining machine to form a first unsupported portion of a mine roof having a preselected length,

a portable temporary support device adapted to be extended laterally and support a substantial portion of a mine roof,

providing power from a power operated means on said self-propelled mining machine to extend said portable temporary support device both laterally and into abutting relation with a substantial portion of said mine roof and the mine floor,

supporting said first unsupported portion of said mine roof with said portable temporary support device, said temporary portable support device being detachable from said self-propelled mining machine,

dislodging additional material from the mine face in said entry to form a second unsupported portion of said mine roof,

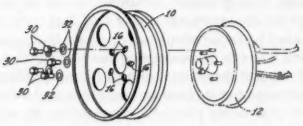
inserting permanent roof supports in said first unsupported portion of said mine roof while said first unsupported portion remains supported by said portable temporary support device, and

inserting permanent roof supports in said second unsupported portion of said mine roof.

3,871,708
CUSTOM WHEEL ASSEMBLY

Roy E. Richter, Downey, Calif., assignor to Cragar Industries, Inc., Compton, Calif.

Filed Apr. 10, 1972, Ser. No. 242,678
Int. Cl. B60b 3/16
U.S. Cl. 301—9 DN 3 Claims



1. A custom wheel assembly to be mounted on different motor vehicle hubs having mounting lug bolts protruding therefrom and disposed on any one of three different predetermined bolt circle radii comprising:

a wheel including a tire supporting rim and a central web portion having a plurality of oblong mounting holes,

each said mounting hole having semi-cylindrical end walls and having its longitudinal dimension radially disposed so as to cooperate with the lug bolts of maximum and minimum bolt circle radii, and having an enlarged arcuate center portion lying on the circumference of a circle of radius larger than that of said end walls, thereby to cooperate with lug bolts on the hub disposed at an intermediate bolt circle radius;

a plurality of sleeve nuts extending into threaded relationship with respective ones of said lug bolts of a particular one of said three bolt circle radii extending through the mounting holes in said web portion;

the sleeve nuts for the lug bolts of maximum and minimum bolt circle radii bearing directly on said semicylindrical end walls to retain said wheel in position on the hub;

the sleeve nuts for the lug bolts of the intermediate circle radius having an outer diameter greater than that of the sleeve nuts for the lug bolts of the maximum and minimum bolt circle radii, and bearing on said arcuate center portion, to retain said wheel in position on the hub.

3,871,709
AIRCRAFT WHEEL CONSTRUCTION

William Joseph Eaton, 4042 Valley Dr., Pueblo, Colo. 81008

Filed July 23, 1973, Ser. No. 381,501
Int. Cl. B60b 3/08; B64c 25/32
U.S. Cl. 301—63 DS 8 Claims

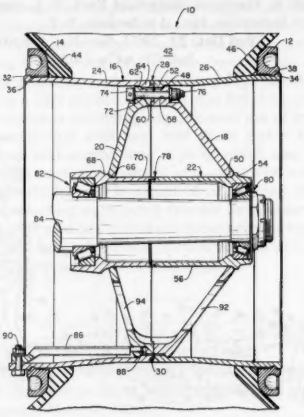
1. An aircraft wheel construction comprising:

a hub section assembly adapted to be located about a wheel axle of an aircraft, a bearing assembly located between said hub section assembly and said axle;

a tire supporting rim assembly;

a flange exteriorly mounted by first means upon said rim adjacent each longitudinal edge of said rim, said first means for permitting axial pivotal movement of each of said flanges relative to said rim caused by lateral loads applied by the tire to said flanges, said flanges adapted to laterally restrain an inflatable tire;

a first disc connected between said rim and said hub section, a second disc connected between said rim and said hub section, said first and second discs connected by second means to said rim, said second means for permitting pivotal movement of said first and second discs relative to said rim, third means for fixedly connecting together said first and second discs, said first and second discs connected by fourth means to said hub section, said fourth

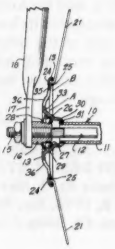


means for permitting pivotal movement of said discs relative to said hub section.

3,871,710
WIDE FLANGE BICYCLE HUB

Walter Dian, Downers Grove, and Charles V. Wrobel, Rolling Meadows, both of Ill., assignors to Beatrice Foods Company, Elgin, Ill.

Filed Dec. 10, 1973, Ser. No. 423,315
Int. Cl. B60b 27/02
U.S. Cl. 301—105 B 8 Claims



1. In a bicycle hub assembly and in combination with a wheel and fork of a bicycle having relatively widely spaced tines:

a shaft having threaded opposite ends mounting the hub and wheel on the bicycle fork;

respective external cones threaded on said opposite ends of the shaft;

a sleeve coaxial with and radially spaced from said shaft;

means for mounting said sleeve for rotation about said shaft comprising spoke attachment flanges fixedly secured to opposite ends of said sleeve and having bell-shaped generally axially outwardly flaring internal cones cooperating rotatably with said external cones through ball bearings between said cones; and

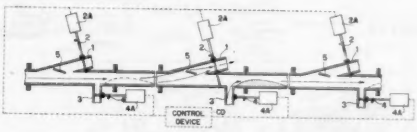
wide generally radial flange portions extending from the axially outer end of said internal cones and flaring generally axially inwardly over at least a portion of said internal cones and positioning the peripheries of said flange portions within the extended limits of said ball bearings; said flange portions having means adjacent their perimeters to

which wheel spokes are attached and the flange portions and the spokes being clear from the tines of the bicycle fork.

3,871,711
METHOD AND APPARATUS FOR PNEUMATICALLY CONVEYING DISCRETE AMOUNTS OF PARTICULATE MATERIAL

Otto Rusterholz, Via G.A. Borgese 14, Milan, Italy

Filed Mar. 21, 1973, Ser. No. 343,273
Claims priority, application Italy, Oct. 25, 1972, 30880/72
Int. Cl. B65g *53/58*
U.S. Cl. 302—26 **12 Claims**



1. A method of conveying an incoherent solid material along a pipeline utilizing a gaseous fluid, comprising the steps of:

forming said pipeline into a plurality of consecutive pipeline trunk sections;

feeding said pipeline at an initial feeding point with a metered amount of said incoherent solid material;

introducing a source of said gaseous fluid at a downstream portion of each said trunk sections while providing a through passage for said material through the respective trunk section;

venting said trunk sections by allowing the gaseous fluid to pass out from the respective truck section at a location downstream of the location where said gaseous fluid is introduced into the respective trunk section;

simultaneously with said venting, closing-off the respective trunk section at a location downstream of the location where the venting was effected and closingoff the introduction of said gaseous fluid into said respective trunk section,

operating consecutive trunk sections alternately in opposite sequence whereby when one trunk section is operating as aforesaid in having said source of gaseous fluid introduced thereto, the next consecutive trunk section is operating as aforesaid to effect venting; and

repeating said operation of said consecutive trunk sections in alternate sequence to thereby impulsively advance said incoherent solid material along said pipeline.

3,871,712
SHAFT FOR DEPOSITING FIBER FLOCKS

Hermann Trutzschler, Rheydt, Germany, assignor to Trutzschler & Co., Rheydt-Odenkirchen, Germany

Filed July 21, 1972, Ser. No. 274,129
Claims priority, application Germany, July 29, 1971, 2137913
Int. Cl. B65g *53/40*
U.S. Cl. 302—59 **3 Claims**

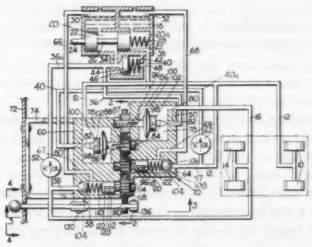
1. In an apparatus for conveying fiber flocks comprising means for conveying said fiber flocks pneumatically into an elongated vertical shaft, said means disposed at the upper end of said shaft and means at the lower end of said shaft for extracting mechanically a wad consisting of fiber flocks deposited in the shaft, the improvement for permitting escape of air from said shaft wherein said shaft is defined by four rectangular vertical air impermeable walls extending between said means for conveying said fiber flocks pneumatically and said means for extracting said fiber flocks, said walls disposed to define a shaft which in cross-section has a rectangular shape, one of said vertical walls consisting of two parts, the first of said parts reaching upwards to said means for conveying fiber flocks pneumatically and having its lower end at a distance remote from said extracting means, the upper end of the second of said parts terminating upwards of the lower end of

said first part and being disposed exteriorly and in overlapping relationship outside of said first part to define a vertical channel between said both parts, said walls of said parts running substantially parallel to one another vertically, the width of said channel between said parts being 2 to 6 mm.

3,871,713
BRAKING SYSTEM FOR VEHICLES HAVING SPEED CONTROLLED PROPORTIONAL BRAKING FOR FRONT AND REAR WHEELS

Paul M. Lister, 1028 S. W. Taylor, Portland, Oreg. 97205

Continuation-in-part of Ser. No. 144,156, May 17, 1971, abandoned. This application Apr. 27, 1973, Ser. No. 355,286
Int. Cl. B60t *8/06, 8/18*
U.S. Cl. 303—6 C **7 Claims**



1. A brake system for vehicles comprising front and rear fluid operated braking means; individual brake applying means for said front and rear braking means operated by a brake pedal; conduit means communicating between said brake applying means and said braking means; and brake control means for each of said front and rear braking means; said brake control means including valves arranged to control flow of the brake applying fluid to the front and rear brakes, adjustment means operatively connected to said valves arranged to influence operation of said valves and provide proportionate braking to the front and rear wheels, and drive means connected to said adjustment means arranged to be connected to the drive shaft portion of a vehicle for positioning said adjustment means so that as the speed of the vehicle increases, greater braking force is made available to the front and rear wheel brakes prior to braking and in a proportion.

3,871,714

FLUID MOTOR DRIVE FOR LIFTING DEVICE SUCH AS A WINCH WITH ACCUMULATED PRESSURE STARTING AFTER BRAKE RELEASE

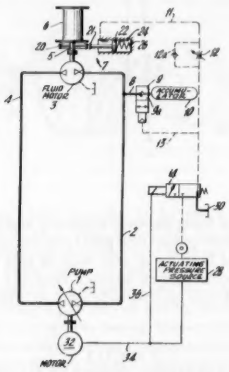
Volkmar Behrend, Bad Schwartau, Germany, assignor to Orenstein & Koppel AG, Lubick, Germany

Filed July 23, 1973, Ser. No. 382,019

Claims priority, application Germany, Aug. 19, 1972, 2240940

Int. Cl. B60t *13/16*; B66d *1/30*

U.S. Cl. 303—10 5 Claims



1. In a fluid motor driven system for driving a rotatable shaft adapted to be connected to a load which is lifted and which has an actuating pressure source, a brake for stopping the shaft which is actuated by an actuating pressure source and in which a pump provides a fluid pressure discharge into a line connected to operate a fluid motor to drive the shaft, the improvement comprising an accumulator connected to the connection between the pump and the motor with means in said connection for permitting the actuating pressure source to be communicated to said accumulator, and an actuating pressure connection from the actuating pressure source to the brake for operating the brake and to the accumulator for operating the accumulator to connect the accumulator to the fluid motor before the brake is released.

2. A fluid drive system for a winch and similar lifting device, comprising a fluid drive motor having a drive shaft adapted to be connected to the lifting device, a brake connected to said drive shaft having a brake applying member which is engageable with said shaft for stopping said shaft, a brake control cylinder, a piston slidable in said control cylinder and engaged with said brake applying member for actuating said member to stop said shaft, means biasing said piston from one side of said cylinder to engage said brake applying member to stop said shaft, said piston being shiftable by brake actuating pressure against said biasing means, a control cylinder pressure line connected to said brake cylinder on the side opposite to said biasing means, an adjustable throttle member in said pressure line, a fluid drive pump having a pump discharge connected to said drive motor to drive said drive motor to rotate said shaft, a pressure accumulator having a pressure release valve connected to said pressure line for actuation by pressure therein, an accumulator pressure line connected from said accumulator to the communication between said pump discharge and said motor to supply accumulator pressure to said motor before the release of said brake, a valve control connected to said pump and to said pressure line venting said control cylinder when said piston actuates said brake but connecting said control cylinder to a source of actuating pressure to release said brake, a source of actuating pressure connected to said valve control, said throttle being set so that said actuating pressure acts on said release valve to connect said accumulating pressure to said motor before said brake is released.

3,871,715

AUTOMATIC BRAKE CONTROLLING METHOD AND DEVICE

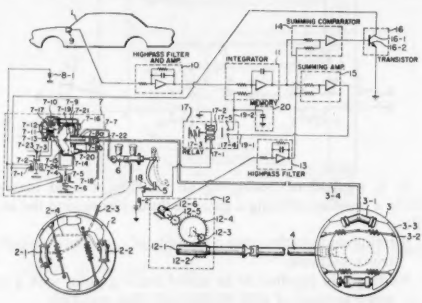
Ryotara Hikida; Yasutaka Hayashi, and Hideo Arakawa, all of Nagoya, Japan, assignors to Kabushiki Kaisha Tyota Chuo Kenkyusho, Nagoya-shi Aichi-ken, Japan

Filed May 1, 1972, Ser. No. 249,220

Claims priority, application Japan, May 4, 1971, 46-29595

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 BE 18 Claims



1. An automatic brake controlling method for a brake to apply the braking forces to wheels of a moving vehicle, comprising

detecting an acceleration of the moving vehicle,

simultaneously detecting a wheel speed of said moving vehicle,

computing a vehicle speed by integrating said acceleration with an integrator,

computing an electrical signal indicating the difference between said vehicle speed and said wheel speed by comparing said computed vehicle speed and said detected wheel speed,

feeding back the electrical signal indicating the difference between said vehicle speed and said wheel speed to said integrator and a memory circuit through a first switching means so as to compute said vehicle speed equal to said wheel speed, whenever the brake is not applied,

opening said feedback circuit immediately after the application of the brake, cancelling drifts, noises, the effects of gravitational acceleration when said moving vehicle is travelling on an inclined road, in the instruments adapted to obtain the vehicle speed such as means for detecting the acceleration by the electrical signal indicating the difference between said vehicle speed and said wheel speed memorized by the memory circuit connected to the input of said integrator,

computing whether a slip ratio of said wheel speed to said vehicle speed is larger than a predetermined value or not, and

controlling the braking force in such manner that the braking force is reduced whenever said slip ratio is larger than said predetermined value and the braking force is recovered whenever said slip ratio is smaller than said predetermined value, when the brake is applied.

14. An automatic brake controlling device according to claim 3, wherein

said means for additionally controlling the braking force produced comprises

a four-way valve having two passages connected to each chamber of a brake booster a passage connected to engine intake manifold, and a piston, and

a relay comprising a solenoid connected to said second switching means and a D - C power source, a core con-

nected to said piston of said four-way valve, and a spring to push said core,

thereby to connect selectively said passages connected to each chamber of a brake booster to said passage connected to engine intake manifold by controlling the position of said piston in response to pushing of the brake pedal, and to control the braking force.

3,871,716

ANTI-LOCK VEHICLE BRAKE SYSTEMS

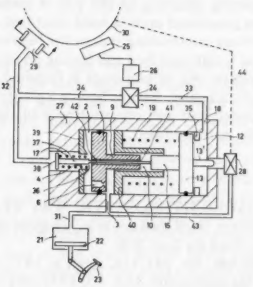
Derek Robert Skoyles, Salford, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 30, 1973, Ser. No. 365,220

Claims priority, application Great Britain, June 19, 1972, 28584/72

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F **13 Claims**



1. Fluid flow control apparatus comprising a housing having inlet and outlet ports, a metering orifice having a first side in fluid communication with said inlet port and a second axially spaced side in fluid communication with said outlet port, a flow-measuring piston carried by said housing for axial movement, with said piston having a first side in fluid communication with said inlet port and a second side in fluid communication with said outlet port, said piston modulating fluid flow upon axial movement thereof and shutting off all flow to said outlet in one axial position fluid outlet pressure never being more than the fluid inlet pressure and the fluid pressure difference across said piston providing a force tending to axially displace said flow-measuring piston into said one axial position, a fluid pressure equalizing path for applying fluid pressure at said outlet port to an equalizing area at the side of said flow-measuring piston remote from said outlet port which equalizing area is isolated from fluid pressure at said inlet port, spring means providing a force tending to displace said flow-measuring piston away from said outlet port in opposition to the force due to said fluid pressure difference, means for axially biasing said flow-measuring piston opposite to said spring means, said apparatus controlling the flow rate of fluid into said outlet port as a function of the force of said spring means and the cross-sectional area of said metering orifice.

3,871,717

HYDRAULICALLY OPERATED BRAKE PRESSURE MODULATOR

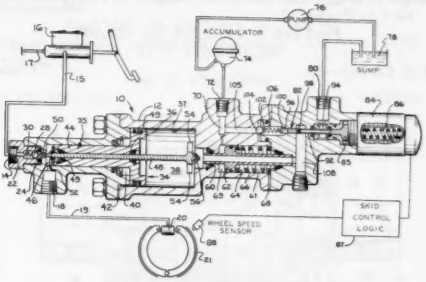
Kenneth D. Jensen, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Sept. 7, 1973, Ser. No. 395,267

Int. Cl. B60t *8/06, 13/16*

U.S. Cl. 303—21 AF **11 Claims**

1. An antiskid brake pressure modulator having an inlet adapted for connection to a brake master cylinder and an outlet adapted for connection to a brake wheel cylinder and being operable in response to a sensed condition at a wheel to be braked and comprising; isolating valve means having a closed position for isolating said inlet from said outlet, piston means movable to form a variable volume chamber at one side between said valve means when the latter is in its closed position and said outlet, said piston means forming a variable pressure chamber at another side of said piston means, a source of secondary fluid pressure communicating with said variable pressure chamber for acting on said piston means and moving the latter between first and second positions to vary the volume of said variable volume chamber, a valve control member supported for movement relative to said piston means



between a first position in which said control member maintains said isolating valve open and a second position in which said isolating valve is closed, and a fail-safe member slidably supported axially of said valve control member and having a normal position spaced from the latter in the presence of pressure at said secondary pressure source to communicate pressure to said variable pressure chamber and being movable to a second position in the absence of pressure at said secondary source to engage said valve control member and isolate said variable pressure chamber from said source and move said control member to its first position.

3,871,718

BRAKE CONTROL DEVICE FOR RAILWAY VEHICLES

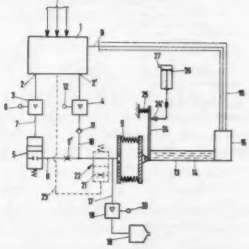
Hans-Jorg Wurth, Lohhof, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Apr. 9, 1974, Ser. No. 459,397

Claims priority, application Germany, Apr. 12, 1973, 2318499

Int. Cl. B60t *8/20*

U.S. Cl. 303—22 R **5 Claims**



1. In a brake control apparatus for railway vehicles and the like, the combination of a brake cylinder responsive to a pressure medium is selected stages of braking, adjustable means indicative of a selected braking stage for generating control signals as reference signals corresponding to a selected braking stage, means for sensing the pressure in the brake cylinder, means responsive to said pressure sensing means for generating actual value signals, means receiving said actual value signals and said reference value signals for comparing

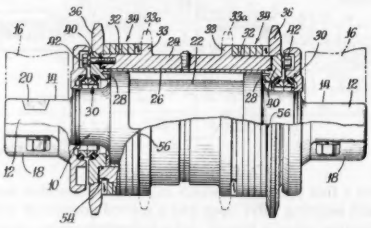
said signals and generating an output signal indicative of said comparison and means including solenoid valves responsive to said output signals for regulating the pressure medium in the brake cylinder in accordance with a selected braking stage by introducing pressure medium into the cylinder and by venting the cylinder.

3,871,719

TRACK ROLLER WITH REPLACEABLE COILED TREAD

Roger L. Boggs, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 1, 1974, Ser. No. 438,666
Int. Cl. B62d *55/14*
U.S. Cl. 305—28 **7 Claims**



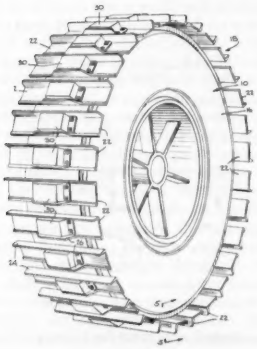
1. In a track roller assembly including a shaft adapted to be affixed to a tractor, a hub rotatably received on the shaft, a pair of treads on opposite ends of the hub and at least two guide flanges, one on each end of said hub, the improvement wherein each of said treads is defined by a plurality of metallic convolutions in side-by-side relationship.

3,871,720

TRACTION TREAD BAND

Crockett Mosshart, and Paul Steve Martinkovic, both of Detroit, Mich., assignors to Uniroyal, Inc., New York, N.Y.

Filed July 31, 1973, Ser. No. 384,187
Int. Cl. B62d *55/26*
U.S. Cl. 305—51 **8 Claims**



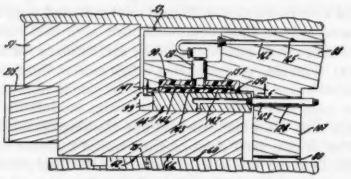
1. In combination, a pneumatic tire and a removable tread band therefor, said tread band having a continuously flexible, inextensible, annular band removably mountable, surroundingly, upon a conforming tread portion of said tire, the improvement comprising: a circumferential array of spaced rigid traction means affixed to said annular band for enhancing tire traction on a substantially soft road-bed; and a circumferential array of spaced elastomeric traction means affixed to said annular band for radially spacing said rigid traction means and absorbing shock from a substantially hard road-bed, said rigid and elastomeric traction means alternating with one another circumferentially of said annular band, said annular band to which are affixed said alternating rigid and elastomeric traction means being at least partially radially compressible for cooperating with said elastomeric traction means and said tire to absorb hard road-bed shocks, said rigid traction means including a plurality of substantially U-shaped grouser bars each of which in cross-section presents a pair of limbs and a transition portion integrally interconnecting said limbs, said elastomeric traction means including a plurality of pads each of which is confined between and embraced by a respective pair of limbs of a corresponding one of said grouser bars, each of said pads having a greater radial extent than the pair of limbs embracing it, each of said pairs of limbs constituting means for resisting shearing of the pad it embraces due to traction forces generated upon a hard road-bed, each of said transition portions constituting means for bearing the weight of the tire upon a soft road-bed and having an undersurface to which a respective one of said pads is fastened, at least one limb of each of said pairs of limbs having a greater axial extent than its associated pad and constituting a blade for gouging the surface of a soft road-bed.

3,871,721

PRE-LOADED HYDROSTATIC WAY BEARING

William R. Siebert, Ford du Lac, Wis., assignor to Giddings & Lewis, Inc., Ford du Lac, Wis.

Division of Ser. No. 241,724, April 6, 1972, Pat. No. 3,772,961. This application Aug. 13, 1973, Ser. No. 387,916
Int. Cl. F16c *17/00*
U.S. Cl. 308—5 **3 Claims**

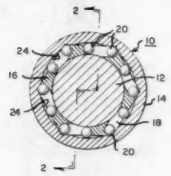


1. In a preloaded hydrostatic way bearing for relatively slidable machine tool members, the combination comprising
a. a supporting member having a supporting bearing surface;
b. a supported member slidably carried on said supporting member, said supported member having both a supported hydrostatic bearing surface disposed in sliding engagement with said supporting bearing surface and a preload hydrostatic bearing surface;
c. a plurality of hydraulic actuators held by said supporting member and linearly-spaced opposite said preload hydrostatic bearing surface; and
d. a plurality of preload gibs, each preload gib having a hydrostatic bearing surface and being interposed between an associated actuator and said preload hydrostatic bearing surface with said gib's hydrostatic bearing surface disposed in sliding engagement with said preload hydrostatic bearing surface;
e. each of said hydraulic actuators including
a flexible bladder means and
means defining a pressure chamber within said bladder means; a rigid core means disposed within said pressure chamber and
f. means for supplying hydraulic pressure to said pressure chambers to cause said actuators to apply a uniform preload force via said gibs to said hydrostatic bearings.

3,871,722
ANTI-FRICTION BALL BEARING ASSEMBLY

Albert R. McCloskey, Fairfield, Conn., assignor to Heim Universal Corporation, Fairfield, Conn.

Filed Aug. 8, 1972, Ser. No. 278,790
Int. Cl. F16c *29/06*
U.S. Cl. 308—6 C 7 Claims

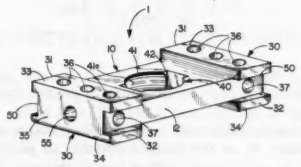


1. An anti-friction ball bearing assembly comprising an outer sleeve and an inner sleeve concentrically fitting within said outer sleeve, said inner sleeve having a central opening for the passage of a shaft therethrough, the inner sleeve having a number of tracks defining paths for the circulation of balls, circulation of a number of load carrying balls and idler balls between said sleeves and said shaft during relative movement between said shaft and said bearing assembly, said idler balls interposed between said load carrying balls, said idler balls having a diameter somewhat less than said load carrying balls, the outer surface of the inner sleeve being polyhedronal in shape, the inner surface of the outer sleeve being provided with a number of guideways, the intersections of the plane portions defining the outer surface of the inner sleeve registering with said guideways, said inner surface of the outer sleeve is further provided with a number of substantially concave bearing surfaces aligned with said tracks such that they provide a rolling bearing surface for said load carrying balls while said load carrying balls are in their loaded state.

3,871,723
MULTI-PURPOSE BEARING MOUNT

Percy E. Pray, 912 Third Ave., South, Minneapolis, Minn. 51515

Filed Dec. 12, 1973, Ser. No. 424,090
Int. Cl. F16c *35/12*
U.S. Cl. 308—15 4 Claims



1. A bearing mount capable of being mounted in a plurality of optional orientations relative to a support surface, said bearing mount comprising:

a. a web member extending between two mounting flanges;

b. a bearing seat located in said web member for receiving a bearing therein with the bearing axis of rotation generally perpendicular to said web member;

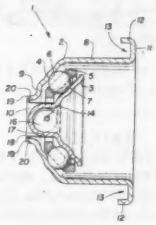
c. each of said flanges having first and second mutually perpendicular mounting surfaces lying in planes removed from said web member, said first mounting surface generally parallel to said web member; and

d. means for selectively securing said bearing mount to the support surface with one of said first or second mounting surfaces of each flange abutting the support surface.

3,871,724
CLUTCH BEARINGS

Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, both of Germany, assignors to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Filed Mar. 30, 1973, Ser. No. 346,581
Claims priority, application Germany, Apr. 13, 1972, 7213788
Int. Cl. F16c *19/04*
U.S. Cl. 308—233 6 Claims



1. A clutch bearing comprising a sheet metal bowl shaped outer ring having a central bore, a sheet metal bowl shaped inner ring having a cylindrically shaped central portion extending within said central bore and a plurality of ball bearing elements located between said inner and outer rings, said outer ring being cylindrically extended to form a sleeve adapted to seat within a conforming bore, and having means extending radially outward therefrom to receive an operating lever, whereby said outer ring may be axial and radially moved relative to said inner ring, a cylindrical sleeve located within the central bore of the outer ring about the extending cylindrical portion of the inner ring, said sleeve being secured to said central portion and having a free end extending radially outward over the edge of the bore of the outer ring to hold said inner and outer rings together.

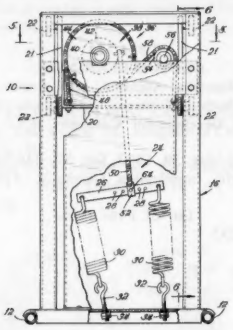
3,871,725
SELF LEVELING MECHANISM FOR TRAY CART

Erik O. Vilen, La Grange Park, and Vytas Zygas, Cicero, both of Ill., assignors to G. S. Blakeslee & Co., Cicero, Ill.

Filed Mar. 18, 1974, Ser. No. 451,985
Int. Cl. A47f *1/06*
U.S. Cl. 312—71 4 Claims

1. For use in a tray cart having main frame means including an upright mast, and a horizontal carrier supported for vertical movement in the upright mast: self leveling mechanism for the carrier comprising a free-floating cross bar, a pair of laterally spaced upright spring units adjacent the lower end of the upright mast, said spring units being secured at their lower ends to the main frame means and at their upper ends to the opposed ends of said cross bar, means for transmitting and reversing the direction of force between the carrier and said cross bar, said force transmitting means being carried by the upright mast adjacent the upper end thereof and having connection with the carrier, means connecting said force transmitting means to said cross bar intermediate of the ends of the latter whereby said spring units impose a tension on said cross

bar and said force transmitting means and thereby urge the carrier upwardly, and said connecting means being adjustably

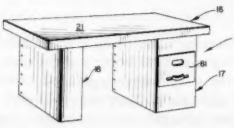


positionable lengthwise of said cross bar for varying the effective tension of said pair of spring units.

3,871,726
KNOCKDOWN DESK AND TABLE

Douglass M. Stegner, 1816 Circle Rd., Ruxton, Md. 21204

Filed June 20, 1973, Ser. No. 371,886
Int. Cl. A47b *41/00, 3/06*
U.S. Cl. 312—195 **8 Claims**



1. A knockdown furniture item such as a desk or table comprising a top having hollow tubular portions of rectangular cross section, two supporting uprights, each of said uprights being of hollow rectangular cross section including walls terminating in upwardly extending tongues, a bottom wall of said top having slots for receiving said tongues, means for interlocking certain of the tongues to the table top, at least certain of said slots being formed in bottom walls of said tubular portions, and an insert forming a part of said top and disposed beneath the central portion of a top wall thereof and between and in close engagement with certain of said tubular portions, said insert comprising two of said tubular portions disposed in side by side abutting engagement.

3,871,727
CURRENT COLLECTING ROLLER

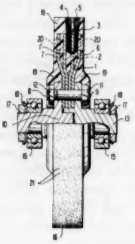
Kazumi Matsui; Takashi Umemori, both of Tokyo; Yutake Shibata, and Kinzo Yamamura, both of Osaka, all of Japan, assignors to Japanese National Railways, Tokyo, and Sumitomo Electric Industries, Ltd., Osaka-shi, both of Japan

Filed Dec. 7, 1972, Ser. No. 313,070
Claims priority, application Japan, Dec. 20, 1971, 46-03432; Dec. 20, 1971, 46-03433; Dec. 20, 1971, 46-03434; Dec. 20, 1971, 46-20398; Dec. 20, 1971, 46-20400; Dec. 20, 1971, 46-20401; Dec. 20, 1971, 46-20402; Dec. 20, 1971, 46-20403; Apr. 25, 1972, 47-41880; Apr. 25, 1972, 47-49254
Int. Cl. H01r *39/64*
U.S. Cl. 339—8 R **21 Claims**

1. A current collecting roller having a cylindrical current collecting surface and comprising:

a. conductor means comprising a plurality of flexible conductors positioned in said roller at least in the proximity of said surface thereof for collecting current from a trolley wire;

b. an elastomer filling the spaces between said conductor and forming the body of said roller;



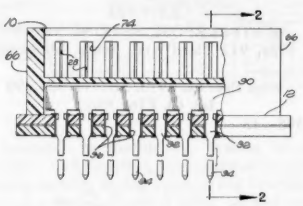
c. the ends of said conductors extending to said cylindrical surface, so that said elastomer and the outer ends of said conductors form said cylindrical current collecting surface; and

d. shaft means for mechanically supporting said roller body, said shaft means being disposed centrally of said roller body and being electrically connected to said plurality of conductors.

3,871,728
MATCHED IMPEDANCE PRINTED CIRCUIT BOARD CONNECTOR

David S. Goodman, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 30, 1973, Ser. No. 420,532
Int. Cl. H01v *3/06;* **H05k** *1/07*
U.S. Cl. 339—14 R **8 Claims**



1. An electrical edge connector for a printed circuit board comprising:

a mounting board having a ground plane and a signal trace separated by an insulator, a plurality of plated through holes in said board, a first plated through hole being connected to said trace, and second and third plated through holes being connected to said ground plane;

an elongated insulative connector housing mounted on said board having a slot therein for receiving the edge of a printed circuit board;

electrical contacts in said housing for engaging said printed circuit board edge;

a grounding bus extending lengthwise in said housing below said slot;

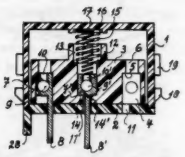
a first contact having a mounting portion mounted in said first plated through hole; and

a second contact and said grounding bus having mounting portions mounted in said second and third plated through holes, respectively.

3,871,729
SYSTEM FOR THE INSTALLATION OF ELECTRIC WIRING IN A BUILDING

Gijsbertus Attema, Gorinchem, Netherlands, assignor to Researchcentrum Ogemat N.V., Gorinchem, Netherlands

Filed Oct. 2, 1972, Ser. No. 294,365
Claims priority, application Netherlands, Oct. 6, 1971, 13699; Oct. 25, 1972, 11599
Int. Cl. H01r 9/00
U.S. Cl. 339—21 R 29 Claims



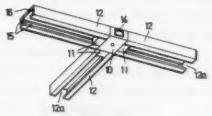
1. A contact plug including
a housing comprising
an elongated bottom member having
apertures extending therethrough in a first direction
contact pins slidably mounted in said apertures and extending from said housing,
means for biasing said contact pins so that they normally extend from said housing,
longitudinal upstanding ribs extending along one surface of said bottom member and defining
grooves extending along said housing in a second direction and intersecting said apertures, and
electrical conductors extending along said grooves and connected to said contact pins and
an elongated cover member for enclosing said ribs, grooves, conductors, and one end of said apertures and including
means against which said biasing means may react when urging said contact pins out of said housing,
means for releasably attaching said bottom member thereto, and
means for releasably attaching said housing behind a pair of ribs within an elongated cable duct having a width dimension which is only wider than the width of said housing by an amount sufficient to allow said attaching means to cooperate with the ribs when said housing is pushed into the duct.

3,871,730
CONNECTING DEVICE FOR CURRENT DISTRIBUTOR RAILS

Kurt Hesse, Lemgo, Germany, assignor to Staff KG, Lemgo, Germany

Filed Mar. 23, 1973, Ser. No. 344,207
Claims priority, application Germany, Apr. 1, 1972, 2216085; Feb. 21, 1973, 7306545
Int. Cl. H01r 9/00
U.S. Cl. 339—21 R 22 Claims

3. A connecting device particularly constructed for electrically connecting together electrical current distributor rails of the type having a generally U-shaped cross section and carrying in insulated relative relation a plurality of current conductors and at least one protective conductor, said connecting device comprising a connecting body adapted for positioning between adjacent ends of a plurality of current distributor rails, a plurality of sockets in said connecting body, said connecting body having therein in insulated relation a plurality of connecting contacts and a plurality of protective contacts opening into said sockets; and a bridging body for each current distributor rail, each bridging body having a first plug connection detachably received in one of said connecting body sockets and a second plug connection for detachable reception in an end of an associated one of said current distributor rails, each of said bridging bodies having a plurality of separate contact bridges each having means for connection to one of said current conductors of an associated current distributor rail and a respective one of said connecting contacts of said connecting body, each of said bridging bodies further having a protective contact bridge for connection to the protective conductor of the respective current distributor rail and the respective protective contact of said connecting body; the respective positions of the protective conductor, protective contact bridge and protective contact on the one hand and the current conductors, connecting contacts and contact bridges on the other hand being such that in the assembly of said connecting device with one of said current distributor rails through the use of one of said bridging bodies a protective

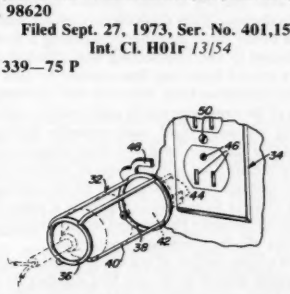


connection is made in advance of a current distributing connection, each said connecting contact having a contact bearing plate and four contact tabs with imaginary tab extensions crossing at a common point, said crossing point being located in a corner of said contact bearing plate, two adjacent ones of said contact tabs extending outwardly at a right angle to each other located on the inner sides of the angle of two adjacent ones of said sockets, and two other contact tabs extending outwardly also at a right angle to each other located on the outsides of the angle of two other two adjacent ones of said sockets, the contact bearing plate of said connecting contact being provided in a free corner between two adjacent tabs with a fixing surface which cooperates with a fixing surface of said connecting body for correct positioning of said contact, said fixing surfaces for all connecting contacts being arranged diagonally and alternately opposite to each other in said connecting body.

3,871,731
CAGE FOR REMOVABLY ENCLOSING COUPLED ELECTRICAL PLUGS

Peter A. LaCoursiere, Sr., Rt. 1, Box 1262, Grandview, Wash. 98930, and Peter A. LaCoursiere, Jr., Box 692, Goldendale, Wash. 98620

Filed Sept. 27, 1973, Ser. No. 401,154
Int. Cl. H01r 13/54
U.S. Cl. 339—75 P 7 Claims



1. A retaining cage for coupled electrical plugs comprising a pair of longitudinally spaced rings, elongated bars extending between and rigidly fixed to said rings, and means providing for a lateral introduction of said cage over coupled electrical

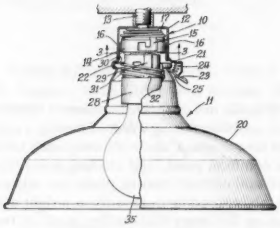
plugs with the plug engaged current conductors projecting outward of the cage through said rings, one of said rings being of a lesser diameter than the internal diameter of the cage defined by the cage bars to preclude movement of a cage received plug therethrough, said bars, at the end corresponding to the one ring of lesser diameter, turning inward to engage this ring, the second ring also being of a lesser diameter than the internal diameter of the bar defined cage.

3,871,732

LIGHT SOCKET WITH AUXILIARY CONTACT

Arthur I. Appleton, 1 Bridlewood Rd., Northbrook, Ill. 60062

Filed June 21, 1973, Ser. No. 372,183
Int. Cl. H01r *13/54, 17/20*
U.S. Cl. 339—91 L **3 Claims**



1. In a light fixture of the type comprising a fixedly mounted base and an assembly releasably attached to the base both of which are aligned with a vertical axis, said assembly and base each including an insulator member having ends in juxtaposition with each other, the assembly member defining a light bulb socket, each member having means, a portion of which is at said end thereof, for providing an electrical circuit from said base to said socket, said portion of said means on one member including a central contact transverse to and intersecting said axis and an annular contact surrounding and spaced a given distance from said central contact, said portion of said means of the other member comprising a first central contact transverse to and intersecting said axis and a second single contact spaced from said first contact by said distance in a first radial direction from said axis and covering only a small portion of the area covered by said annular contact, said contacts being relatively rigid, said assembly having means releasably holding said members with their ends so juxtaposed which holding means does not necessarily hold the members rigidly in that position but may permit some rocking of one member with respect to the other whereby a poor electrical circuit may occur between the second single contact and said annular contact, the improvement comprising:

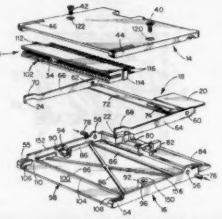
said portion of said means of the other member including a third contact spaced from said first contact by said distance in a second radial direction angularly positioned from said first radial direction, said third contact covering only a small portion of the area covered by said annular contact, said portion of said means of the other member including a spring arm resiliently supporting said third contact from said other member.

3,871,733

CONNECTOR ASSEMBLY HAVING POSITIVE RETENTION MEANS

Eberhardt P. Praeger, Natick, Mass., and Richard P. Stanton, Clearwater, Fla., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 18, 1972, Ser. No. 316,335
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 R **18 Claims**



1. A connector assembly for use with a printed circuit board having a plurality of printed circuit contacts and at least one retention hole, said assembly comprising:

A. a lower plate comprising

1. slot means at one end of said lower plate for receiving a cable having a plurality of wires,
2. connector retention means at the other end of said lower plate for receiving a connector having a plurality of contacts for mating with said printed circuit contacts, and
3. pivot means on either side of said lower plate near said one end of said lower plate;

B. further retention means pivotably mounted with said pivot means of said lower plate, said further retention means made from one piece of material and having depression means extending beyond said one end of said lower plate and at least one retention plug for engaging said at least one retention hole on said printed circuit board.

C. an upper plate secured to said lower plate, both said plates partially enclosing said further retention means, said received cable and said connector; and

D. means, securely attached to said further retention means and enclosed between said upper and lower plates, for enabling said at least one plug means in a normal position for engaging said at least one retention hole when said upper and lower plates are secured together, except when said depression means is depressed.

3,871,734

ELECTRICAL CONDUCTING FLUID TIGHT TUBULAR ASSEMBLY

Delbert Lyle Murtland, 20612 Kelvin Ln., Huntington Beach, Calif. 92646

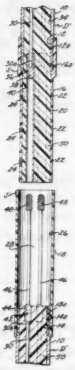
Filed Feb. 25, 1974, Ser. No. 445,129
Int. Cl. H01r *7/02*
U.S. Cl. 339—94 M **9 Claims**

1. A fluid tight tubular assembly that includes a plurality of engaging sections that are longitudinally movable relative to one another and are disposed in coaxial alignment end to end in an oil well bore hole to supply electric power to a device situated in said bore hole, said assembly being removably secured to a string of oil well tubing situated in said bore hole and extending longitudinally therein, said tubular assembly including:

a. a plurality of said sections, with each of said sections comprising:

1. an elongate tubular member that has first and second ends;

2. first and second tubular sleeves that are longitudinally aligned with said tubular members and extend outwardly from said first and second ends thereof, with the exterior diameter of said first sleeve being slightly less than the interior diameter of said second sleeve;
3. a plurality of longitudinally extending laterally spaced electrical conducting cables in said tubular member;
4. a plurality of electrical conducting tubes in said first sleeve that are laterally spaced from one another and in electrical communication with said cables;
5. a plurality of rigid elongate electrical conducting prongs in said second sleeve that are in the same lateral spacing as said tubes, with said prongs being of such transverse cross section as to be slidably insertable in one of said tubes of an adjacently disposed one of said



sections, and each of said prongs when so inserted establishing electrical communication between said prong and said tube in which it is inserted;
6. a solidifed non-electrical conducting material in said tubular member and first sleeve that holds said cables and tubes in said lateral spacing, and said material gripping the portions of said prongs most adjacent said tubular member to maintain said prongs in said lateral spacing in said second sleeve; and
7. a plurality of longitudinally spaced, circumferentially extending resilient sealing rings mounted on the exterior surface of said first sleeve that effect a fluid tight seal between said first sleeve and a second sleeve of an adjacent one of said sections when said first sleeve is longitudinally inserted in the latter;

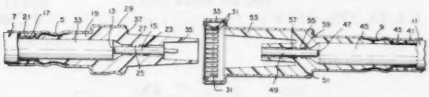
b. first means for electrically connecting said tubes in said first sleeve of the lowermost one of said sections in said bore hole to the terminals of said device;
c. second means for electrically connecting said prongs in said second sleeve of the uppermost one of said sections to a source of electric power, with said assembly between said lowermost and uppermost sections comprising a plurality of said sections that are axially aligned with said first and second sleeves of the adjacent end portions of said plurality of sections in slidable sealing engagement and said tubes and prongs thereof also in slidable electrical communication with one another; and
d. third means for removably securing each of said sections to said tubing string to maintain said tubular assembly in fixed lateral spacing relative thereto, with said tubular assembly elongating and contracting as said tubing string changes in length due to variations in temperature in said bore hole by said first and second sections and tubes and prongs therein of adjacently disposed of said sections moving longitudinally relative to one another.

3,871,735

SHIELDED HIGH VOLTAGE CONNECTOR

Henry Otto Herrmann, Jr., Mt. Joy, Pa., assignor to AMP Incorporated, Harrisburgh, Pa.

Filed Aug. 23, 1973, Ser. No. 390,812
Int. Cl. H01r *17/06*
U.S. Cl. 339—177 R **10 Claims**



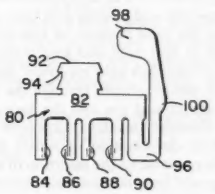
1. An electrical connector member which comprises, in combination,
a. a wire having an inner conductor and an outer conductor electrically separated from said inner conductor by insulation and surrounding said inner conductor,
b. a pin secured to said inner conductor,
c. a body of rigid electrically insulating material positioned over said insulation, said outer conductor extending over the outer surface of said body, and
d. a first electrically conducting metal can frictionally secured to said body and crimped to said outer conductor, wherein said body defines a shoulder and a reduced diameter nose forward of said housing, said first can being frictionally secured to said body behind said shoulder and extending over said shoulder.

3,871,736

CONNECTORS PROVIDING INTERCONNECTION BETWEEN CLOSELY SPACED CONDUCTORS AND WIDELY SPACED TERMINALS

Clyde Thomas Carter, Shermans Dale, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 20, 1973, Ser. No. 399,240
Int. Cl. H01r *9/08, 13/54*
U.S. Cl. 339—221 R **3 Claims**



1. An electrical connector mounted in a housing to make good electrical and mechanical interconnection between a circuit board attached to one side of the housing and a terminal adjacent the opposite side of the housing, comprising:
a connector body having at least one retention projection extending from each of two opposite sides of said body;
a resilient circuit board contacting arm comprising a simple beam extending from said body and having a contact projection on the free end thereof;
at least one pair of resilient, parallel, spaced apart legs depending from said body and adapted to resiliently grip said terminal therebetween; and
a resilient test access arm integral with one of said legs and adapted to extend therefrom in cantilever fashion to project from said housing thereby providing constant test access to said connector.

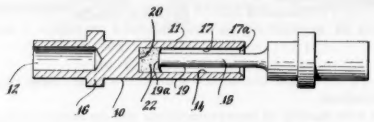
3,871,737
SOCKET CONTACT WITH CONDUCTIVE ELASTOMER CONTACTING SURFACE

Robert Francis Dorrell, Des Plaines, and Norman Richard Anderson, Cicero, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 323,867, Jan. 15, 1973, abandoned. This application June 5, 1974, Ser. No. 476,612

Int. Cl. H01r *13/12*

U.S. Cl. 339—255 R **2 Claims**



1. A socket contact for use in an electrical connector adapted to receive a metal pin, said pin having a peripheral surface and a transverse forward end surface for establishing an electrical connection between said pin and contact comprising:

a metallic contact body having an elongated hole formed therein with an elongated axis, said hole extending from one end of said body and defined by an axially extending peripheral surface portion, a rear metal surface on said body at a position spaced in one direction from said one end of said body to define a rear axial end of said hole; an axially extending layer of conductive elastomer material positioned in said hole with said layer of elastomer material having a peripheral surface extending axially of said hole and engaging said peripheral surface portion of said hole throughout the axial extent of the peripheral surface of said layer of elastomer material;

a rear surface on said layer of elastomer material engaged with the rear metal surface defining the rear axial end of said hole; and

a forward surface on said layer of conductive elastomer material spaced from the one end of said body and transverse to the axis of said pin and hole with the forward surface of said layer of elastomer material terminating the peripheral surface of said layer and having an area corresponding to the area of said transverse forward end surface of said pin and placing said layer of elastomer material under the axial pressure of said pin between the rear axial end of said hole and said transverse forward end surface to establish said electrical connection as a low resistance electrical path through the transverse forward end surface of said pin and the forward surface of said layer of elastomer material transverse to the axis of said pin without deformation of either said pin or socket contact in response to the insertion of said pin in said hole to engage said layer of elastomer material under said axial pressure.

3,871,738
FUSE CONTACTS

Helen Dechelette, Saint Cloud, France, assignor to AMP Incorporated, Harrisburg, Pa.

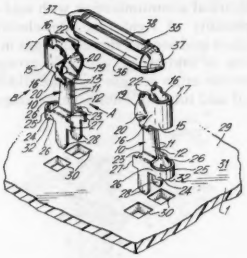
Filed Nov. 29, 1973, Ser. No. 420,181

Claims priority, application France, Dec. 14, 1972, 72.44595

Int. Cl. H05k *1/04*

U.S. Cl. 339—256 C **4 Claims**

1. A unitary electrical contact for a cartridge fuse having conical conductive ends, the contact being stamped and formed from resilient sheet metal and comprising two superposed strips having a contiguous portion forming a composite leg disposed in a first plane and having a mounting foot at one end, the strips being bent apart at the other end and being integrally joined at the other end by a U channel receptacle having two spaced walls joined by a bight, the channel extending generally along the axis of the composite leg with the walls located in second and third planes generally parallel to the first plane, each channel wall being bent at an end portion remote from the bight away from the other wall into the form



of a part surface of a cone the apex of which is located between the bight and the end portions and the axis of which extends from the apex away from the bight and between the channel walls, the two part-conical surfaces forming a contact portion.

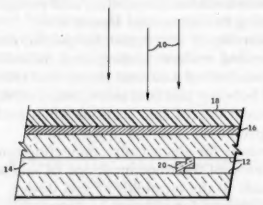
3,871,739
SYSTEM FOR PROTECTION FROM LASER RADIATION

Peter D. Poulsen, Huntsville, Ala., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Aug. 14, 1972, Ser. No. 280,312

Int. Cl. G02b *5/26*

U.S. Cl. 350—1 **3 Claims**

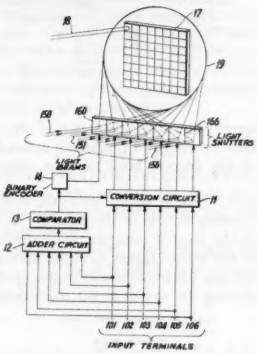


1. In a protective means for protecting against high energy infrared radiation comprising a sheet which is substantially transparent to visible light, an object sensitive to high energy radition on the first side of said sheet and a high energy infrared laser radiation source on the second side of said sheet, said sheet having a coating on said second side of said sheet which is substantially reflecting to infrared radiation and substantially transmitting to visible light; the improvement comprising about a 0.001 to 0.005 inch thick layer over said coating of a material which vaporized without residue when subjected to said laser radiation, whereby contamination on said layer is blown away without damage to said coating and said sheet, and said coating remains transparent to visible light and reflecting to infrared radiation.

3,871,740
BINARY CODE CONVERSION TO PRODUCE BINARY HOLOGRAMS WITH ENHANCED DIFFRACTION EFFICIENCY

Itsuo Matsubara, Kanagawa, and Mitsuhito Sakaguchi, Tokyo, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Nippon Electric Company Limited, both of Tokyo, Japan

Filed Mar. 12, 1974, Ser. No. 450,401
Claims priority, application Japan, Mar. 14, 1973, 48-28964
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 2 Claims



1. An arrangement for manufacturing a holographic memory plate with a number of mini-holograms recorded thereon in lines and columns, each mini-hologram being formed by the interference of a coherent reference beam and plural information-bearing coherent light beams, comprising:

a plurality of input terminals for receiving binary signals supplied in a parallel word-by-word fashion,

means for counting for each binary signal word the number of those digits which are in a predetermined one of the two binary states,

means responsive to the binary state digit counting means for providing a control signal when the number exceeds one half of the binary digits of each said word,

means coupled with said input terminals and responsive to said control signal supplied thereto by said control signal providing means for selectively inverting the states of said binary digits,

means for converting said control signal into a binary digit,

means for generating a plurality of parallel coherent light beams equal in number to the number of binary digits in each word plus one for the control signal binary digit,

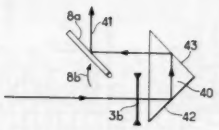
shutter means disposed in the light paths of said parallel coherent beams for controlling the passage of light therethrough such that each of said parallel coherent beams is selectively blocked or passed in response to the state of a different one of said binary digits provided by the output of said selective inverting means and said converting means,

a photographic plate disposed to be irradiated by said light beams transmitted through said shutter means, and means for irradiating said photographic plate simultaneously with a reference beam to form interference patterns with the output beams from said shutter means to form one mini-hologram on said photographic plate.

3,871,741
COMPACT OPTICAL SYSTEM PERMITTING INSTANTANEOUS INCREASE IN MAGNIFICATION WITHOUT REFOCUSSING

Serge Clave, and Marcel Clave, both of 9 rue Oliver Metra, Paris, France 75020

Filed Apr. 19, 1973, Ser. No. 352,610
Claims priority, application France, Apr. 26, 1972, 72.14870
Int. Cl. G02b 7/04
U.S. Cl. 350—37 5 Claims



1. An optical system comprising:

an eyepiece,

an objective,

movable reflecting means pivotally mounted between said eyepiece and objective to swing between a first position and a second position,

stationary reflecting means, and

stationary image-amplifying means,

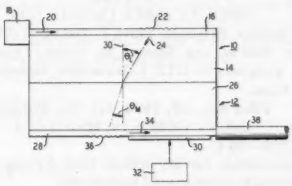
said movable reflecting means being positioned to reflect light rays from said objective to said eyepiece along a first patch excluding said image-amplifying means and stationary reflecting means, when said reflecting means is in said first position, and to reflect light rays from said objective to said eyepiece along a second path from said objective to said eyepiece including said stationary reflecting means and said image-amplifying means when said movable reflecting means is in said second position,

said second optical path being longer than said first optical path by a distance equal to the increase in the distance between said objective and the image formed thereby resulting from the inclusion of said image-amplifying means in said second optical path.

3,871,742
COMPOSITE THIN FILM OPTICAL DEVICE

Ivan Paul Kaminow, New Shrewbury, and Herwig Werner Kogelnik, Fair Haven, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 18, 1973, Ser. No. 407,522
Int. Cl. G02b 5/14
U.S. Cl. 350—96 WG 9 Claims



1. A device comprising substrate means having wave propagating layers on spaced-apart surfaces thereof, means interposed in the path of waves propagated in one of said layers for directing said waves through said substrate means to impinge upon said other layer, and means associated with said other layer and interposed in the path of said directed waves for causing said directed waves to propagate in said other layer, wherein said substrate means comprises two distinct substrate

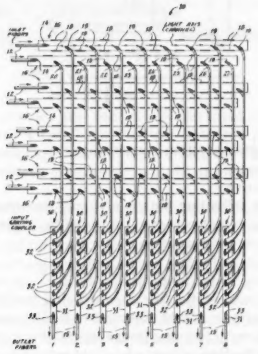
members butted together, each of said members having an optical waveguiding thin film thereon.

3,871,743

OPTICAL CROSSPOINT SWITCHING MATRIX FOR AN OPTICAL COMMUNICATIONS SYSTEM

John E. Fulenwider, Concord, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed June 4, 1973, Ser. No. 366,941
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **11 Claims**



1. An optical switch for an optical communications system comprising:

a thin film light propagating channel formed on a supporting substrate of lower refractive index and having a longitudinal axis, an inlet port thereon adapted to be optically coupled to an external input signal of light, and a plurality of outlet ports also formed on the substrate and spaced one from another along said longitudinal axis and joined directly to the thin film light propagating channel and to a plurality of coupling fibers, said channel propagating said input signal along said longitudinal axis; and

switching means for interconnecting said input signal to any selected one of said outlet ports, said switching means including a means for optically steering the input signal from said longitudinal axis toward the selected one of said outlet ports, whereby any input signal may be switched through any selected outlet port for transmission.

3,871,744

OPTICAL FIBER CONNECTOR

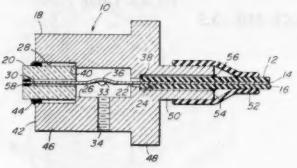
ıdrew Bridger, Brighton; Mark L. Dakss, Waltham; Stanley Zemon, Boston, and Samuel M. Stone, Lynnfield, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 19, 1974, Ser. No. 498,805
Int. Cl. G02b *5/14;* **H01r** *13/58*
i. Cl. 350—96 C **9 Claims**

. A connector for an optical fiber having a protective ath normally therearound comprising

main body having a generally cylindrical external configuration and front and rear surfaces, the optical fiber entering the main body through the rear surface and terminating adjacent to the front surface, the main body having a first, generally axial bore extending inwardly from the rear surface toward the front surface and being sized to receive the optical fiber freely therethrough, the first bore having a forward portion and an enlarged diameter rear portion, the enlarged portion being sized to receive freely the sheath and optical fiber over the full length thereof, the main body also having a second bore extending rearwardly from the front surface generally parallel to the first bore and having a rear portion and an enlarged diameter forward portion, and communicating at the rear thereof with the first bore,

an inner rigid right circular cylindrical sleeve being disposed in the enlarged forward portion of the second bore and having an axial bore therethrough, the bore of the inner sleeve being sized to enable the optical fiber to be inserted therein, the outer diameter of the inner sleeve being within the range of diameters defined by the rear portion of the second bore and the enlarged portion thereof,



means for affixing the optical fiber to the inner sleeve,

means for forming a bow in the optical fiber in the rear portion of the second bore so that external forces are exerted on the sheath rather than the optical fiber,

means for affixing the inner sleeve to the main body, and

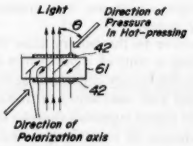
means for affixing the sheath to the main body.

3,871,745

VISUAL INFORMATION STORAGE AND DISPLAY DEVICE

Shigeru Waku; Shintaro Hayashi, both of Tokyo; Hiroyuki Shibata, Tokorozawa, and Takehisa Kawashima, Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Mar. 21, 1973, Ser. No. 343,337
Claims priority, application Japan, Mar. 27, 1972, 47-29782; Nov. 14, 1972, 47-11344
Int. Cl. G02f *1/26*
U.S. Cl. 350—150 **11 Claims**



1. An information storage and display device which comprises a thin ceramic sheet having an optical axis oriented before the application of electrodes thereto at an angle of between 30° and 90° with the normal direction to the surface of the sheet, said sheet being cut out from a transparent ferroelectric ceramic block having an optically uniaxial anisotropy without annealing, wherein the direction of polarization axis orients antiparallel and that of optical axis orients parallel to direction of applied pressure during and after the hot-pressing stage; photoconductive films and transparent electrodes for writing and erasing informations by light and provided over both sides of said ceramic sheet; a light source and a power source for writing and erasing information by light; and a means of polarized light optic system for displaying the storaged informations.

3,871,746
LIQUID CRYSTAL CELL

Ryujiro Muto; Shigemasa Furuuchi, both of Yokohama; Hiroshi Ukihashi, Tokyo; Katsuo Uchijima, and Hiromichi Nishimura, both of Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

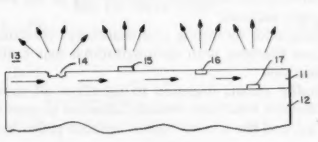
Filed June 6, 1973, Ser. No. 367,527
Claims priority, application Japan, June 6, 1972, 47-55681
Int. Cl. G02f *1/34*
U.S. Cl. 350—160 LC **10 Claims**

1. In a liquid crystal cell filled with a liquid crystal material between the pair of plates sealed with a sealant and disposed at a designated distance from one another by a spacing element therefor, the improvement which comprises the use of a sealant of tetrafluoroethylene-ethylene copolymer or chlorotrifluoroethylene-ethylene copolymer.

3,871,747
OPTICAL WAVEGUIDE DISPLAY PANEL

Ronald A. Andrews, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1972, Ser. No. 294,733
Int. Cl. G02f *1/16*
U.S. Cl. 350—160 R **16 Claims**



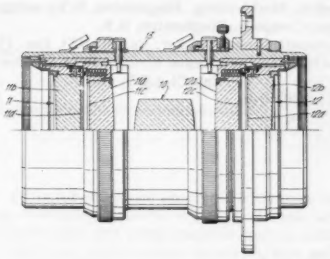
1. An optical waveguide display panel; which comprises,
a substrate,
at least one slab or dielectric material of uniform thickness secured onto said substrate, said slab of dielectric material having an index of refraction higher than said substrate,
a waveguide region formed by each of said slabs of dielectric material in which coupled light is trapped and directed along a trapped light optical path,
at least one abrupt discontinuity means in each of said waveguide regions in optical alignment along the trapped light optical path of each of said waveguide regions forming at least one light scattering center in each waveguide region for scattering light out of said waveguide region upon encountering an abrupt discontinuity means therein,
whereby light scattered out of each waveguide region by each of said abrupt discontinuity means is scattered in all possible directions from said waveguide region.

3,871,748
ANAMORPHOTIC OPTICAL OBJECTIVE

David John Day, Cheltenham, England, assignor to The Rank Organisation Limited, Millbanks, London, England

Filed Mar. 29, 1973, Ser. No. 346,188
Claims priority, application United Kingdom, Mar. 29, 1972, 14814/72
Int. Cl. G02b *13/08*
U.S. Cl. 350—181 **6 Claims**

1. An anamorphotic objective system comprising a spherical lens unit and two cylindrical lens groups constituted by one cylindrical lens group in front of the spherical lens unit and one cylindrical lens group to the rear of the spherical lens unit, wherein each cylindrical lens group comprises a pair of cylindrical lenses, one convergent and one divergent, and the cylindrical lens groups are individually parfocal between their

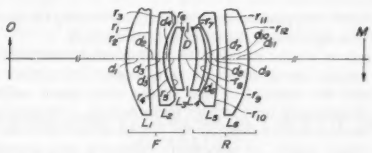


cylindrically active and cylindrically passive planes with respect to the object plane and the focal plane of the spherical lens unit, the cylindrical lenses in each group being relatively movable in the axial direction to maintain equality of focus between the cylindrically active and cylindrically passive planes during variation of the anamorphotic effect.

3,871,749
LENS SYSTEM HAVING MAGNIFICATION X1

Kenichi Harada, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed June 11, 1973, Ser. No. 368,680
Claims priority, application Japan, June 20, 1972, 47-61468
Int. Cl. G02b *9/62*
U.S. Cl. 350—215 **3 Claims**



1. A lens system having a magnification ×1 with a front lens group and a rear lens group separated by a diaphragm space, said front lens group consisting of a first positive meniscus lens, a second negative meniscus lens and a third positive meniscus lens, said lenses all being convex toward the object side, said rear lens group consisting of a fourth positive meniscus lens, a fifth negative meniscus lens and a sixth positive meniscus lens, said lenses all being convex toward the image side, said front and rear lens groups being made completely symmetrical to each other with respect to said diaphragm, and defined by the following four conditions, i.e.,

$0.01f < d_2 < 0.04f$, 1.
$1.9 < r_2/r_3 < 2\text{-}1$, 2.
$0.01f < d_4 < 0.03f$, 3.

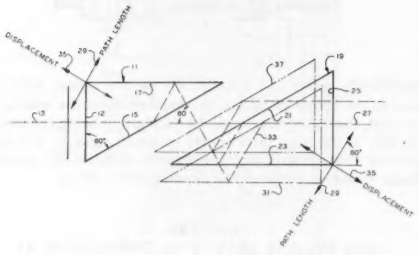
and

$0.74 < r_4/r_5 < 0.81$ 4.

where f is an overall focal length, d_2 an air space between the first positive meniscus lens and the second negative meniscus lens, r_2 a radius of curvature of the rear surface of the first positive meniscus lens, *rhd 3* a radius of curvature of the front surface of the second negative meniscus lens, d_4 an air space between the second negative meniscus lens and the third positive meniscus lens, r_4 a radius of curvature of the rear surface of the second negative meniscus lens, and r_5 a radius

of curvature of the front surface of the third positive meniscus lens.

3,871,750
FOCUSING ROLL AND DISPLACEMENT PRISMS
Richard A. Mecklenborg, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.
Continuation-in-part of Ser. No. 207,033, Dec. 13, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 417,308
Int. Cl. G02b *5/04*
U.S. Cl. 350—286 **16 Claims**



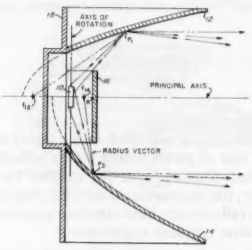
1. Optical apparatus for selectively controlling the transmission of a light image therethrough comprising:

a pair of similar prisms each having substantially the same angular construction, an entry-exit or first surface opposite the smallest or first of the three prism angles for transmitting light images therethrough, a hypotenuse or second surface opposite the largest or second of the three prism angles for selectively reflecting and transmitting light images impinging thereon, and a third surface opposite the third angle for reflecting light images impinging thereon,

a first prism of said pair arranged for receiving at its entry-exit surface a light image traveling along a first optical axis of said apparatus, said received image being internally reflected from said hypotenuse surface and said third surface, respectively, prior to being transmitted through said hypotenuse surface, said first prism being further arranged such that the angle of incidence of said light image at said hypotenuse surface is greater than the critical angle when reflection of the image is required and less than the critical angle when transmission is required, a second prism of said pair being arranged so that its hypotenuse surface is parallel and adjacent to the hypotenuse surface of said first prism for receiving said light image from said first prism and then, subsequent to internally reflecting said light image from said third surface and said hypotenuse surface, respectively, transmitting said light image through said entry-exit face of said second prism along a second optical axis parallel to said first optical axis; and

means for selectively positioning one of said first an second prisms along a first line which makes an angle with said second optical axis, which angle is equivalent to the third prism angle, to change the path length of said light image through said optical apparatus.

3,871,751
CATOPTRIC LENS ARRANGEMENT
Werner R. Rambauske, Carlisle, and Philip J. McFarland, Lynnfield, both of Mass., assignors to Raytheon Company, Lexington, Mass.
Filed July 2, 1973, Ser. No. 375,562
Int. Cl. G02b *5/10*
U.S. Cl. 350—293 **2 Claims**



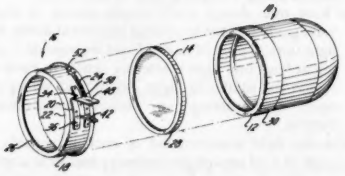
1. In a catoptric arrangement for forming from light radiated by a light source having a substantially cylindrical incandescent filament, a fan-shaped beam wherein substantially all aberrant rays are directed toward one of the broader sides of such beams, the improvement comprising:

a. a first and a second opposing mirror, each one being concave and having a reflecting surface corresponding to the surface generated by rotating a segment of a different quadratic conic section about a line, such line passing between the adjacent focal points of the two quadratic conic sections;

b. means for mounting a substantially cylindrical incandescent filament with its longitudinal axis collinear to the line; and

c. baffle means disposed to intercept all rays from such filament which are initially directed to pass between the first and the second mirror without reflection.

3,871,752
EASILY CHANGEABLE FILTER HOLDER
Max Habinger, Landing, N.J., assignor to Hygro Dynamics Industries, Inc., Landing, N.J.
Filed Aug. 20, 1973, Ser. No. 389,521
Int. Cl. G02b *7/00*
U.S. Cl. 350—318 **6 Claims**



1. In combination:

a housing for supporting a light source;

support means removably secured to said housing for supporting a filter with respect to said housing, said support means comprising,

a split ring member having first and second ends biased toward one another, whereby said split ring member frictionally engages said housing, said split ring member including an annular flange for supporting said filter, and said housing includes an outer extremity portion which urges said filter against said flange when said split ring member is frictionally engaged on said housing;

manually grapsable release means for temporarily enlarging said split ring member, whereby said split ring member can be easily removed from said housing, said manually graspable release means comprising first and second L-shaped members secured to said split ring member, said first L-shaped member including a base portion having one segment thereof secured to said first end of said split ring member and a second segment thereof freely overlapping said second end of said split ring member and an outwardly directed leg portion extending from said second segment; said second L-shaped member including a base portion having one segment thereof secured to said second end of said split ring member and a second seggment thereof freely overlapping said first end of said split ring member and an outwardly directed leg portion extending from said second segment; whereby urging said outwardly directed leg portions toward one another will cause the separation of said first and second ends and enlargement of said split ring member; and

further including expansible biasing means one end of which is secured to one of said outwardly directed leg portions and the other end of which is secured to said split ring member for normally urging said first and second ends toward one another.

3,871,753

OPHTHALMOLOGICAL FIXATION LAMP ASSEMBLY

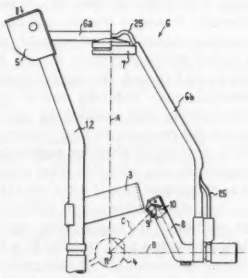
Hans Papritz, Liebefeld, and Kurt Hagi, Niederwangen, both of Switzerland, assignors to Haag-Streit AG, Bern, Switzerland

Filed Apr. 17, 1973, Ser. No. 351,847

Claims priority, application Switzerland, Apr. 24, 1972, 6025/72

Int. Cl. A61b *3/00*

U.S. Cl. 351—37 **9 Claims**



1. An ophthalmological fixation lamp assembly, comprising a head-rest for a patient; a light collimator having an optical axis; bearing means coupling said collimator to said head-rest for movement of said collimator about a plurality of axes intercepting one another at a position corresponding to the center of rotation of an eye of the patient, said bearing means constraining the optical axis of said collimator to pass through said position of interception independently of the position of said collimator about said plurality of axes whereby said eye may be fixed at any position while the other eye of the patient is examined; said bearing means including guide means disposed over said head-rest for enabling horizontal movement of said collimator relative to said head-rest for bringing the collimator in front of either eye of the patient; said guide means having a guide element fixedly attached over said head rest, and carriage means movable along said guide element; and said bearing means having a first arm extending from said carriage means, and a second arm pivotally connected with said first arm for rotation about one of said plurality of axes; said collimator being pivotally coupled to said second arm for rotation about another of said plurality of axes.

3,871,754

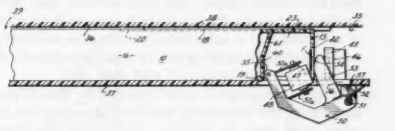
FILM PROJECTOR AND CARTRIDGE APPARATUS

Alex J. Procop, and Ace Boultinghouse, both of Northridge, Calif., assignors to Target Systems Corporation, Northridge, Calif.

Filed Aug. 22, 1973, Ser. No. 390,390

Int. Cl. G03b *31/02*

U.S. Cl. 352—29 **27 Claims**



1. Film projector and sound apparatus of the type utilizing a cartridge containing a film having a sound track, said cartridge being movable into a first operable position within said projector and being withdrawable therefrom, said apparatus comprising,

sound pickup means in said projector for picking up sound information from said sound track,

film advancing means in said projector for moving said film past said pickup means,

film-engaging means for engaging and urging said film into engagement with said sound pickup means and said film advancing means in direct response to movement of said cartridge into said first position,

said film-engaging means being retractable away from said film in direct response to withdrawal movement of said cartridge,

first cartridge engaging means for moving said film engaging means toward an operative position when said cartridge is moved toward said first position, and

second cartridge engaging means for holding said film-engaging means in engagement with said film when said cartridge is in said first position, said second cartridge engaging means being movable into engagement with said cartridge in response to movement of said first cartridge engaging means by said cartridge.

3,871,755

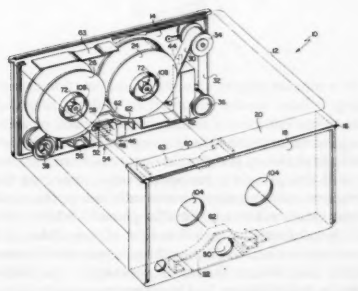
PHOTOGRAPHIC FILM HANDLING CASSETTE AND APPARATUS

Joseph H. Wright, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 29, 1972, Ser. No. 319,536

Int. Cl. G03b *23/04*

U.S. Cl. 352—130 **7 Claims**



6. A reel for holding an elongated web of material and being adapted to be rotatably driven by an externally mounted drive means that is rotatable about an axis and includes an off axis

drive surface for engaging and rotatably driving said reel, said reel comprising:

a central hub section about which the elongated material is adapted to be wound, said hub section having an axis of rotation about which reel is adapted to be rotated by the externally mounted drive means;

at least one reel flange coupled to and coaxially disposed with said hub section for supporting an elongated web of material wound about said hub section, said flange extending outwardly from said hub section in a radial plane of said reel that is substantially normal to said reel axis of rotation and terminating in a circular peripheral edge that defines a circumference of said reel; and

coupling means adapted to be engaged by the off axis drive surface of the externally mounted drive means for coupling said reel in driving relation to the externally mounted drive means, said coupling means including a convex surface that is substantially normal to said radial plane of said reel and extends outwardly from said hub section toward said circumference of said reel.

3,871,756

MOTION PICTURE CAMERAS WITH AUTOMATIC FOCUSSING MEANS

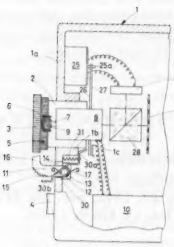
Albert Stieringer, Stadt, and Gerhard Borner, Musbert, both of Germany, assignors to Robert Bosch Photokino GmbH, Stuttgart, Germany

Filed June 7, 1973, Ser. No. 367,973

Claims priority, application Germany, June 19, 1972, 2229615

Int. Cl. G03b *3/10*

U.S. Cl. 352—140 **17 Claims**



1. In a motion picture camera, a combination comprising a housing; release means mounted in said housing and being actuatable to initiate the making of exposures; picture taking lens means mounted in said housing for movement between a plurality of positions at different distances from the film plane; automatic focussing means operatively connected with said lens means and operative to normally select the position of said lens means relative to the film plane — while said release means is actuated — as a function of the distance from a selected subject and to change the position of said lens means — while said release means is actuated — in response to changes in said distance; and blocking means actuatable at the will of the operator — while said release means is actuated — to effect a retention of said lens means in a position selected therefor by said focussing means whereby said lens means remains in said selected position, even if said distance changes, as long as said blocking means remains actuated.

3,871,757

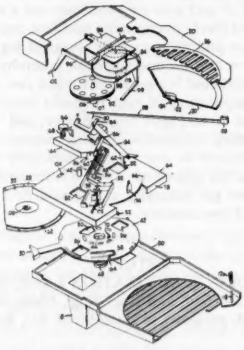
INDEX MEANS FOR AUDIO-VISUAL DEVICE

Marvin I. Glass, Chicago, and Gunars Licitis, Lombard, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Continuation of Ser. No. 555,200, June 3, 1966, Pat. No. 3,484,160. This application May 13, 1969, Ser. No. 824,158

Int. Cl. G02b *27/02;* **G09f** *27/00;* **G03b** *31/06*

U.S. Cl. 353—7 **4 Claims**



1. In an audio-visual device for stereoscopic viewing of pairs of photographic transparencies and for reproducing accompanying sounds, said device including a housing, a transparency-carrying disc having a plurality of pairs of circumferentially arranged transparencies mounted therein and adapted to be inserted in said housing, a sound record rotatably mounted on said disc, and a stylus means mounted in said housing for movement relative to said record, the improvement comprising means for simultaneously indexing one of said pairs of transparencies for viewing and positioning said stylus for reproduction of a related message on said record, said indexing means comrising a rotatable plate for supporting said disc within said housing and having a lever portion projecting from the housing, so that movement of said lever effects rotation of said plate and said disc, stylus guide means within said housing comprising a part positioned for engagement with said stylus means and movable through a path parallel to a face of said rotatable plate, a toothed rack fixed to said part, and a pawl in said housing which is movable in response to the rotary movement of said plate to engage a tooth of said rack and move said rack to thereby effect movement of said stylus guide means through a predetermined increment of travel.

3,871,758

AUDIO-VISUAL APPARATUS AND RECORD MEMBER THEREFORE

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 14,751, Feb. 24, 1970, Pat. No. 3,582,201, which is a continuation-in-part of Ser. No. 518,685, Jan. 4, 1966, abandoned. This application June 1, 1971, Ser. No. 148,513

Int. Cl. G03b *31/06*

U.S. Cl. 353—19 **4 Claims**

1. An audio-visual apparatus comprising in combination:

a record disc assembly composed of concentrically arranged first and second disc members,

means for rotatably supporting one of said disc members with respect to the other and means for separately power rotating both of said disc members about a common axis,

a spiral groove formed in a first of said disc members,

magnetic recording material defining a spiral track on said first disc member,

said second disc member being provided with a plurality of image frame locations extending in a circular track which is concentric with said first disc member and means for removably securing at least one photographic image containing member at each of said frame locations,

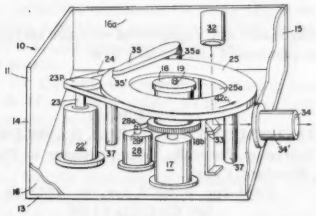
first means for rotating said first disc member at substantially constant speed,

means for holding said second disc member from rotating while said first disc rotates,

a projection optical system including means for projecting light through a selected frame of said second disc member,

means for receiving said projected light and displaying an image of the frame photographic containing member scanned,

means for selectively rotating said second disc member to selectively bring each of said photographic image containing members into the field of said projection optical system,



a pivoted arm including a needle operative to ride in and follow the groove in said first disc member as said disc member rotates,

a magnetic transducer supported by said pivoted arm and located thereon to scan said spiral magnetic track when said needle is riding in said spiral groove of said first disc member,

amplifier and speaker means operatively connected to said magnetic transducer for generating audio playback of the recordings on said spiral magnetic track as said magnetic transducer reproduces signals therefrom,

electrically operated means for causing said second disc member to step rotate to remove and replace one photographic image containing member disposed in the field of said projection optical system with the next photographic image containing member of said second disc,

control means for said electrically operated means, and

means for generating control signals as said first disc rotates for intermittently activating said control means and for synchronizing the operation of said first and second rotating means whereby selected portions of the sound produced from said magnetic track are generated while selected respective images are projected to said displaying means.

3,871,759

READER-SELECTOR INSTRUMENT FOR ULTRA-HIGH REDUCTION MICROFILM

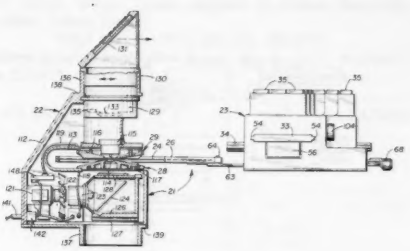
Wynn D. Crew, Denver, Colo., assignor to Microtech Press Inc., Lakewood, Colo.

Filed Dec. 30, 1971, Ser. No. 214,096

Int. Cl. G03b *1/50, 23/08, 21/16*

U.S. Cl. 353—95 **7 Claims**

1. A projector component for use when viewing image pages and the detail materials thereof that are presented in ordered arrangement at a reduced size on a film strip comprising a support body, a magnifying lens mounted in said body, a high intensity light source supported by said body and projecting a beam of light therefrom along an axis angularly disposed with respect to the axis of said lens, a pair of film gates movably mounted on said body adjacent said lens to intercept light from said light source and providing a receptacle for said film strip between said film gates, a selective reflector in the light path intermediate said light source and lens for differentially directing visible light and infra-red heat



energy whereby the heat energy radiates along a path directed away from said lens, adjusting means between a first film gate and said body, and an elastic element disposed for urging said second film gate toward contact with said film strip and the said first film gate in its adjusted positions whereby the distance between the film strip in said film gate receptacle and said lens may be closely adjusted.

3,871,760

GUIDING THE FILM IN MOVIE PROJECTORS

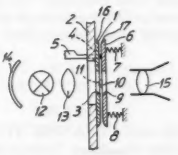
Johann Roth, Schwabhausen, Germany, assignor to Braun Aktiengesellschaft, Frankfurt/Main, Germany

Filed Apr. 9, 1973, Ser. No. 349,474

Claims priority, application Germany, Apr. 18, 1972, 2218793

Int. Cl. G03b *1/48*

U.S. Cl. 353—95 **9 Claims**

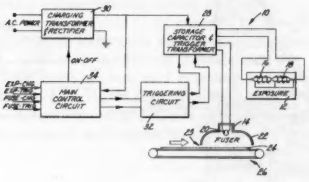


1. A film guiding arrangement for guiding a film of a certain thickness within a film projection apparatus comprising a film table and a pressure plate in substantially parallel relationship with said film table, biasing means for biasing said film pressure plate against said film table, spacing means provided on both sides of said film adjacent the respective outer edges of said film, said spacing means being mounted in operative relationship with either said film table or said pressure plate for maintaining a gap between said film table and said film pressure plate during the absence of said film and which gap is narrower than the thickness of the film, said film pressure plate being tiltable with respect to said film table, whereby film being inserted into said arrangement at a film entrance side causes said gap thereat to increase while at a film exit side, said gap decreases.

3,871,761
ELECTROPHOTOGRAPHIC FLASH SYSTEM

Saied Abd-Elrahman Mabrouk, Cleveland Heights, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Dec. 3, 1973, Ser. No. 421,122
Int. Cl. G03g *15/22*
U.S. Cl. 355—11 **15 Claims**



1. In an electrophotographic reproduction apparatus for producing copies of original documents, a flash system comprising:

flash exposure means for irradiating original documents to be copied,

flash fusing means for irradiating toner images on copy material support surfaces and fusing the images thereon, a voltage source,

flash power supply means connected to said voltage source for controlled energization of either said flash exposure means or alternately said flash fusing means, and

control circuit means operative in an exposure mode to cause said flash power supply means to energize said flash exposure means and operative in a fuse mode to cause said flash power supply means to energize said flash fusing means,

said flash power supply means including energy storage means for storing energy for said flash exposure means and said flash fusing means, and charging circuit means for charging said storage means, said control circuit means being operative in a pre-expose mode to effect operation of said charging circuit means prior to energization of said flash exposure means and operative in a pre-fuse mode to effect operation of said charging circuit means prior to each energization of said flash fusing means.

3,871,762
BLADE CLEANING SYSTEM

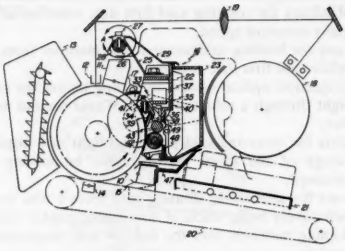
Wilhelmus Van Der Vlasakker, Venray, Netherlands, assignor to Rank Xerox Limited, London, England

Filed Nov. 1, 1973, Ser. No. 411,851
Claims priority, application Netherlands, Nov. 10, 1972, 7215211
Int. Cl. G03g *15/00*
U.S. Cl. 355—15 **7 Claims**

1. A cleaning assembly for removing residual particles from a moving image-bearing surface of an electrostatographic apparatus, comprising:

a housing including a chamber for receiving removed particles, said housing having longitudinal engagement edges extending in the direction of movement of said surface for engaging said surface, said housing being mounted for angular movement about an axis which extends transversely of the housing, and said housing in its operative position being biased so that said engagement edges are held in engagement with said surface; and

a cleaning device within said housing for removing said particles from said image-bearing surface, said device being pivotably mounted in said housing, said device

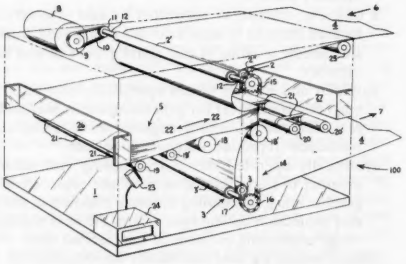


being biased into engagement with said surface by means independent of said housing bias.

3,871,763
PHOTO-CONDUCTIVE MATERIAL HANDLING DEVICE

Ernst Schrempp, Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 2, 1973, Ser. No. 384,808
Int. Cl. G03g *15/00*
U.S. Cl. 355—16 **6 Claims**



1. A xerographic plate handling device for a copier system, said handling device being operative to store and dispense an endless belt supporting a photoconductive material, said device comprising:

means for supporting a first given quantity of said belt in a substantially flat fan-folded array, said supporting means having at least one rotatable supportive member adapted to support said array;

means operatively associated with said supporting means for feeding a second quantity of said belt through a copier system for the purpose of making copies of an original document, said second quantity of said belt arranged in an endless loop with said first quantity of material, said means also causing reciprocal movement of said fan-folded array as a unit mass with respect to said supporting means; and

means for rotatively driving said supportive member so as to facilitate said reciprocal movement of said fan-folded array as a unit mass with respect to said support means.

3,871,764
PATTERN GENERATOR APPARATUS

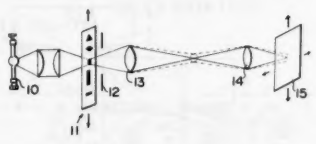
Junichi Nishizawa, No. 6-5, Tsuchitoi 1-chome, Sendai, Japan

Filed Nov. 8, 1972, Ser. No. 304,841

Claims priority, application Japan, Apr. 5, 1972, 47-34229; Apr. 5, 1972, 47-34230; Apr. 11, 1972, 47-36295; Apr. 13, 1972, 47-38095; Apr. 13, 1972, 47-38096; Apr. 13, 1972, 47-38097; Apr. 13, 1972, 47-38098; Apr. 17, 1972, 47-38499

Int. Cl. G03b *27/50*

U.S. Cl. 355—18 **15 Claims**



1. Pattern generator apparatus for projecting from means for determining a pattern, a corresponding light image onto a sensitive surface, said apparatus comprising:

a. a light source;

b. means for disposing the pattern determining means into the path of said light source to provide a light image corresponding to the pattern; and

c. optical lens means including a varifocal lens for varying the degree of magnification of the light image and a reducing lens for directing and reducing the light image of varied magnification onto the sensitive surface whereby the surface is sensitized with a patterned image of reduced size with respect to the pattern of the pattern determining means.

3,871,765
DEVICE FOR ADJUSTING FOCAL DISTANCE OF A PHOTOGRAPHIC ENLARGING APPARATUS

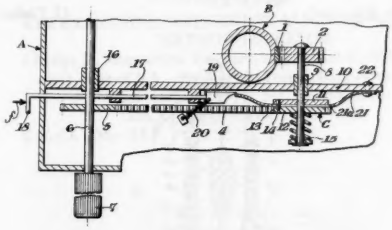
Wilmut Pramstraller, Brixen near Bozen, Italy, assignor to Durst S.p.A. Fabbrica Macchine ed Apparecchi Fototecnici, Bolzano-Bozen, Italy

Filed Sept. 26, 1973, Ser. No. 400,978

Claims priority, application Italy, Sept. 29, 1972, 29868/72

Int. Cl. G03b *27/32*

U.S. Cl. 355—18 **12 Claims**



1. An adjusting device for the movable head of a photographic apparatus mounted upon a guide column comprising an adjusting wheel in translating engagement with the guide column, an adjustment drive means actuatable from the front of the apparatus, a disengageable clutch between the adjustment drive means and the adjusting wheel, the disengageable clutch being constructed and arranged to be normally engaged to cause movement of the adjusting wheel in response to the movement of the adjustment drive means, an actuating element connected to the clutch for disengaging it to prevent movement of the adjustment drive means when the head is being moved relative to the guide column in a coarse adjusting movement whereby the adjustment drive means may be grasped together with the clutch actuating to effect such movement, and the actuating element being constructed and arranged to be actuated from the front of the apparatus.

3,871,766
IMAGE EXPOSURE DEVICE

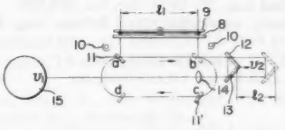
Shozo Inoue, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1973, Ser. No. 356,928

Claims priority, application Japan, May 6, 1972, 47-52882; June 2, 1973, 48-65640

Int. Cl. G03b *27/16*

U.S. Cl. 355—66 **8 Claims**



1. An image exposure device for applying the information of a stationary original to a moving photosensitive medium by a movable scanning mirror through a slit, comprising:

means for holding the original at a fixed position;

means for illuminating the original;

a plurality of movable mirrors disposed on an endless track to scan the image light from the original only when they are moving in one direction;

endless guides for guiding said plurality of movable mirrors;

power transmission members for moving said plurality of movable mirrors along said endless guides;

mirror support members for engageably supporting said mirrors for movement along said endless guides; and

connecting members for connecting said mirror support members to said power transmission members.

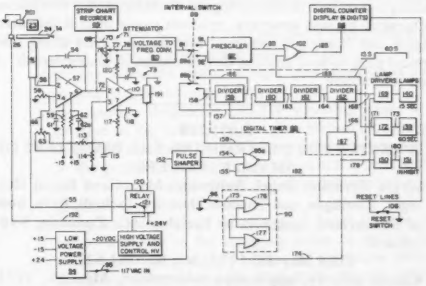
3,871,767
APPARATUS FOR DETERMINING LUMINESCENCE

Osmund Holm-Hansen, La Jolla, and Charles Rockwell Booth, San Diego, both of Calif., assignors to Science Applications, Inc., La Jolla, Calif.

Filed June 20, 1973, Ser. No. 371,738

Int. Cl. G01j *1/46*

U.S. Cl. 356—215 **13 Claims**



1. In an apparatus for the detection of the presence of micro-organisms in a test sample by means of a bioluminescent reaction comprising first means for providing a pulse train output having a frequency value which varies in proportion to the light output of a test sample as contacted by a

reactant, timer means, start means for initiating operation of said timer means, said timer means being operative to provide a first signal at a predetermined delay period after operation of said start means to initiate an integration period, and a second signal at a later selected time to terminate said integration period, means enabled by said pulse train during the time period defined by said first and second signals to provide an output which represents the integrated value of the light output of said sample, and output means for providing signals representative of such integrated value.

3,871,768

MOLECULAR EMISSION CAVITY ANALYSIS

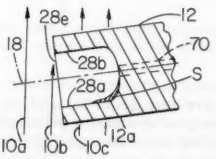
Ronald Belcher, 9 Chad Rd., Birmingham B15 3EM; Alan Townshend, 2 Selby Close, Birmingham B29 2JG, and Stanley Bogdanski, Flat 8, 7 Park Hill, Birmingham 13, all of England

Filed Aug. 20, 1973, Ser. No. 389,587

Claims priority, application Great Britain, Aug. 24, 1972, 39443/72

Int. Cl. G01j *3/30*

U.S. Cl. 356—87 **41 Claims**



1. A method of analyzing a sample of a matter by emission spectroscopy in which a reactant sample is exposed to flame gas to produce emissions and the emissions are detected by an optical analysis device, characterized by the steps of providing an emission-promoting strucutre defining a sheltered region, exposing reactant vapor within said region to flame gas and focusing the optical analysis device upon the interacting gases in said region and further characterized by providing said sheltered region by a structure which surrounds and defines a hollow space with an open end, introducing the sample to the space, and maintaining said structure in relation to an external flame so that at least said open end lies in the interior of a flame with the predominant direction of movement of the flame gases in the vicinity of the said open end being generally across the said open end.

10. An emission-promoting structure for use in an analyzer in conjunction with a flame and an optical emission analysis device, said structure defining a sheltered region for containing reactant, an exposure path for flame gas to interact with the reactant in the sheltered region and an optical path projecting out of said sheltered region whereby, under conditions influenced by said structure, reactant vapor in said sheltered region and flame gas can mix, interact and emit along said optical path to said analysis device radiation characteristic of said interaction.

3,871,769

APPARATUS FOR DETERMINING THE DIAMETERS OF SMALL PARTICLES

Andreas Hermann Engel, Baltimore, Md.; Gerd Bernd Herziger, Gumligen, and Theodor Heinrich Tschudi, Bern, both of Switzerland, assignors to Turlabor AG, Zumikon, Switzerland

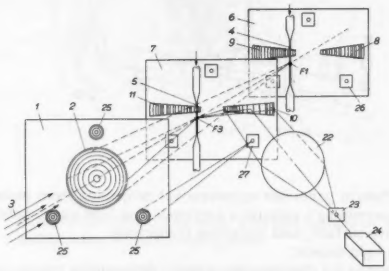
Filed May 18, 1973, Ser. No. 361,625

Claims priority, application Switzerland, May 19, 1972, 007527/72

Int. Cl. G01n *15/02*

U.S. Cl. 356—102 **5 Claims**

1. An apparatus for determining the diameters of small particles in which coherent light is scattered by said particles and the scattered light wavefronts are substituted with wavefronts previously recorded on hologram filters, wherein the improvement comprises first lens means for collecting said coherent light into a plurality of focal points, a sample of said particles being disposed in each of said focal points, at least one hologram filter positioned behind each of said focal points, said hologram filters each being adapted to convert the light waves scattered by particles of a predetermined different diameter into output light waves having a spherical wavefront, separate light-measuring means associated with each of said hologram filters for receiving said output light waves from



each of said hologram filters, second lens means and apertured diaphragm means being interposed between said hologram filters and the light-measuring means associated therewith and having said output light waves pass therethrough, said light-measuring means each generating an electrical signal in response to said output light waves received from said hologram filters, said signal being linearly dependent upon the intensity of the light received and attaining a maximum value when the diameter of illuminated particle is equal to the predetermined particle diameter at which the respective hologram filter emanuates output light waves having a spherical wavefront.

3,871,770

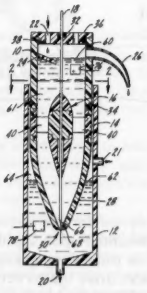
HYDRODYNAMIC FOCUSING METHOD AND APPARATUS

Wieland E. von Behrens, and Gordon C. Oates, both of Seattle, Wash., assignors to Nuclear Data, Inc., Palatine, Ill.

Filed June 4, 1973, Ser. No. 366,401

Int. Cl. G01n *21/26*

U.S. Cl. 356—103 **12 Claims**



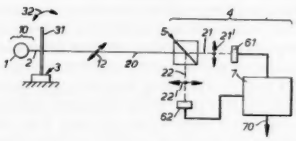
1. A method for the hydrodynamic focusing of particles into a monofile including the steps of introducing a sample suspension, in an axial direction, into a fluid medium having a spiral flow pattern, passing the particles of the sample in monofile through a narrowly defined geometric path, and monitoring

the particles in the monofile as they pass through a sensing zone.

3,871,771
OPTICAL APPARATUS FOR DETERMINING DEVIATIONS FROM A PREDETERMINED FORM OF A SURFACE

Richard Nelson Scott, Skeets Farm, Flanchford Rd., Leigh near Reigate, England

Filed June 8, 1973, Ser. No. 368,319
Claims priority, application Great Britain, June 9, 1972, 26942/72; Apr. 18, 1973, 18718/73
Int. Cl. G01b *11/30*
U.S. Cl. 356—114 **10 Claims**

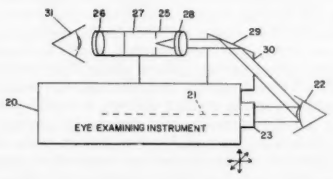


1. Optical apparatus for determining deviations from a predetermined form of a surface, comprising a laser light source means for projecting a beam of light from said source to establish a predetermined axis, a sensing means including an optical element traversed by said light beam, said sensing means arranged to travel with said optical element and including follower means producing displacement of said optical element in relation to said light beam in response to said deviation of said surface whereby said optical element produces a rotation of the plane of polarisation of said light beam which is representative of the measured deviation, and a detector means positioned to receive the light beam after traversing said optical element, said detector means including optical beam splitter means for dividing said light beam into two components having mutually perpendicular planes of polarisation, two photoelectric elements each responsive to one of the component beams to yield a respective output signal representative of the magnitude of that component, and circuit means for combining said output signals thereby to obtain a signal representative of the measured deviation.

3,871,772
EYE EXAMINING INSTRUMENT ALIGNING MEANS AND METHOD THEREFOR

Charles R. Munnerlyn, Fairport, and Robert C. Moore, Rochester, both of N.Y., assignors to Tropel, Inc., Fairport, N.Y

Filed Apr. 23, 1973, Ser. No. 353,648
Int. Cl. G01b *11/27*; **A61b** *3/00*
U.S. Cl. 356—153 **3 Claims**



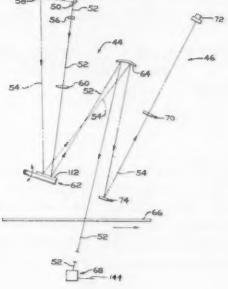
1. An eye viewer for aligning the optical axis of an eye examining instrument with an eye and spacing said instrument a predetermined distance from said eye, said viewer comprising:

a. a source of radiant energy;
b. means for directing a beam of said radiant energy on said eye along said optical axis;
c. means mounted on said instrument off said optical axis for forming a viewable image from said radiant energy;
d. means for focusing radiant energy reflected from said eye at an acute angle from said optical axis and onto said image forming means so the field of view of said image forming means intersects said optical axis at said predetermined distance from said eye;
e. means for adjusting said instrument transversely of said eye for centering said radiant energy beam on said eye as viewed in said image forming means to align said beam with said eye; and
f. means for adjusting said instrument in the direction of said optical axis to center said image of said eye in said field of view of said image forming means for spacing said instrument said predetermined distance from said eye.

3,871,773
METHOD OF AND APPARATUS FOR DETECTING DEFECTS AND THE POSITION THEREOF IN TRANSPARENT ARTICLES

Hugh E. Shaw, Jr., New Kensington, Pa., assignor to PPG Industries Inc., Pittsburgh, Pa.

Filed Apr. 24, 1973, Ser. No. 354,030
Int. Cl. G01n *21/16*
U.S. Cl. 356—200 **15 Claims**



1. A method of determining defects in a glass ribbon as a function of position in the glass ribbon, comprising the steps of:

directing a first beam of light toward a first surface of the glass ribbon as a scanning beam of light;

directing a second beam of light toward position sensing means as a positioning beam of light;

synchronously displacing (1) the scanning beam of light relative to the surface of the glass ribbon along a predetermined scan path and (2) the positioning beam relative to the position sensing means wherein the beams of light are synchronously displaced at a predetermined constant speed;

sensing the intensity of the scanning beam of light with a photo detector as the scanning beam of light is moved with respect to the glass ribbon to determine defects in the glass ribbon along the scan path wherein defects in the glass ribbon along the scan path vary the intensity of the scanning beam of light; and

monitoring the position sensing means and the photo detector to determine the position of the scanning beam along

the scan path to determine defects in the glass ribbon as a function of position in the glass ribbon.

3,871,774

METHOD AND APPARATUS FOR DETECTING CRACKS IN UNHULLED GRAINS

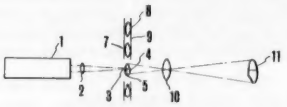
Noboru Murata, Tokyo, Japan, assignor to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1973, Ser. No. 388,766

Claims priority, application Japan, Sept. 8, 1972, 47-89621; Sept. 11, 1972, 47-106258[U]

Int. Cl. G01n *21/22, 21/32*

U.S. Cl. 356—201 **9 Claims**



1. A method of detecting cracks in unhulled grains comprising the steps of irradiating the grains with a laser beam thereby causing said laser beam to be scattered and or absorbed by said grains and indicating the variation in the quantity of said laser beam after transmitting through said grains as a function of the portion of a grain not illuminated because of a crack in said grain.

3,871,775

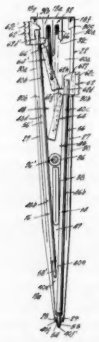
MECHANICAL WRITING INSTRUMENT

Nathan A. Zepell, 1359 Teresita Dr., Santa Barbara, Calif. 93105

Filed Nov. 20, 1973, Ser. No. 417,515

Int. Cl. B43k *27/12*

U.S. Cl. 401—31 **21 Claims**



1. A writing instrument having a plurality of writing points comprising a body member having first and second channels merging into a common point opening at one end thereof, first and second writing members each having a writing point disposed in said respective first and second channels in retracted positions and mounted for reciprocation therein to extend their respective writing points through said point opening into an extended writing position, first manual actuating means operatively connected to said first writing member and extending exteriorly of said body member for manually moving said first writing member in said first channel toward said point opening and into said extended writing position, second manual actuating means operatively connected to said second writing member and extending exteriorly of said body member for manually moving said second writing member in said second channel toward said point opening and into said extended writing position, first holding and releasing means operatively connected to said first actuating means and to said body member and being operable in a first position to hold said second writing member in said extended writing position and being operable in a second position to release said second writing member, second holding and releasing means operatively connected to said second actuating means and to said body member and being operable in a first position to hold said first writing member in said extended writing position and being operable in a second position to release said first writing member, first returning means operatively connected to said body member and to said second holding and releasing means for returning said second writing member from said extended writing position to said retracted position in response to the actuation of said first holding and releasing means to said second position and second returning means operatively connected to said body member and to said first holding and releasing means for returning said first writing member from said extended writing position to said retracted position in response to the actuation of said second holding and releasing means to said second position.

3,871,776

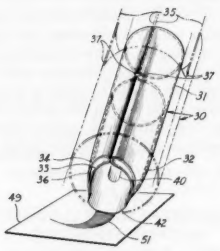
WRITING PENS

Ben Braun, 15 Georgia Dr., Syosset, N.Y. 11791

Filed Mar. 8, 1974, Ser. No. 449,527

Int. Cl. B43k *17/00*

U.S. Cl. 401—256 **11 Claims**

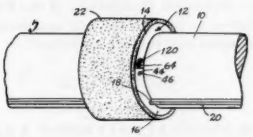


1. A pen having a pair of contiguous nibs defining an intervening ink feeding channel and terminating at their forward ends in a flexible writing tip wherein the improvement comprises, an embouchure to constitute means for tracking ink, said embouchure having a pair of shaped lips constituting the respective forward ends of said nibs, said lips being disposed in progressive-spring contact defining a capillary mouth for passing ink therethrough, said lips being generally turned upwardly from the point of common contact in the absence of writing pressure on the pen, means resiliently supporting said lips for movements together in response to writing pressure thereon and for reforming thereby said mouth into a cross-slit for ink feeding action, said lips constituting substantially a progressive-spring means responsive to hand pressure for controlling the spreading movements of said mouth whereby a line may drawn of corresponding breadth.

3,871,777
CLAMPING MEANS FOR SPLIT ROTARY ANVIL AND THE LIKE

Louis E. Sauer, St. Louis, Mo., assignor to L. E. Sauer Machine Co., St. Louis, Mo.

Filed Dec. 22, 1972, Ser. No. 317,830
Int. Cl. F16d 1/06; B60b 27/06
U.S. Cl. 403—20 13 Claims

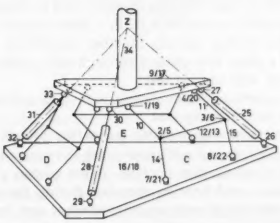


1. In a split rotary anvil or the like, comprising mating, arcuate members adapted for mounting upon a cylindrical rotatable shaft, a clamping mechanism for clamping mating ends of said arcuate members togehter, at least one mating end having a pin protruding therefrom and pivotally attached thereto for free pivotal movement with respect to said at least one mating end, and the end to be clamped to said at least one mating end having an orifice therein adapted to receive said pin, said pin having a transverse groove adjacent is protruding end to provide a camming surface thereon and the end of said arcuate member bearing said orifice having camming means for engaging and applying pressure to said camming surface after reception of the pin by the orifice, thereby permitting the mating ends to be clamped together, and wherein upon juxtaposition of said mating ends, the inner periphery of said rotary anvil approximates an ellipse with a respective major axis passing through at least one pair of juxtaposed ends and a minor axis being normal thereto.

3,871,778
MECHANISM FOR COUPLING TWO OBJECTS

Anthonius Maria Schulte, Delden, and Uilko Van Der Wal, Hengelo, both of Netherlands, assignors to N. V. Hollandse Signaalapperten, Hengelo (O), Netherlands

Filed Feb. 9, 1971, Ser. No. 113,977
Claims priority, application Netherlands, Feb. 11, 1970, 7001896
Int. Cl. F16c 11/00
U.S. Cl. 403—52 6 Claims

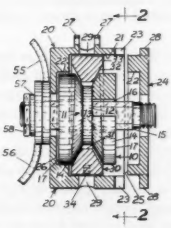


1. A mechanism for coupling two objects comprising at least one elastic element connected between said objects, a plurality of coupling devices connected between said objects, each of said coupling devices comprising two linkage systems connected to each other at sides thereof remote from the objects coupled by said coupling devices, each system comprising linkage elements connected by four hinges so as to form a closed parallelogram loop, said hinges being located at the vertices of said parallelogram, opposite linkage elements of each of said systems arranged for rotational movement relative to the object their respective system is directly coupled to about the hinges of their system, means connecting one of said systems of each coupling device to one of said objects so as to permit rotational movement of said system as an entire unit about a first axis and relative to said object connected thereto, the direction of said first axis being different from the direction of the axes about which said linkage elements can rotate, and means for connecting said other system of said coupling device to the other of said objects and to said first system so that said other system is capable of rotational movement about a second axis parallel to said first axis relative to said other object connected thereto or relative to said first system, wherein three of said coupling devices are provided between said objects, each of said coupling devices lying in a plane containing said first and second axes, said planes passing through a common point and intersecting each other forming three lines none of which are parallel or coincident.

3,871,779
MECHANICAL CONNECTIONS

James W. Butler, 117 Grant Ave., Bellevue, Pa. 15202

Continuation-in-part of Ser. Nos. 311,785, Sept. 26, 1963, abandoned, and Ser. No. 873,680, Nov. 3, 1969, abandoned.
This application Dec. 19, 1972, Ser. No. 316,492
Int. Cl. A61f 1/04
U.S. Cl. 403—52 13 Claims



1. In a mechanical rotatable joint, a driving element and a driven element; and means in contact with said driving and said driven elements for securing the same for concentric rotation therebetween; said means being adjustable to secure said driving and said driven elements for eccentric rotatability relative to each other, to thereby restrain the relative rotation therebetween.

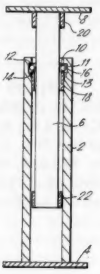
3,871,780
DEVICE FOR LOCKING TWO CONCENTRICALLY POSITIONED AND AXIALLY DISPLACEABLE MEMBERS

Jon-Erik Svensson, Skillingaryd, Sweden, assignor to Skillingaryds Mekaniska AB, Skillingaryd, Sweden

Filed Nov. 5, 1973, Ser. No. 412,714
Claims priority, application Sweden, Nov. 3, 1972, 14258/72
Int. Cl. F16b 7/14
U.S. Cl. 403—104 3 Claims

1. A device for locking two concentrically positioned and axially displaceable members against displacement in one direction, characterized by a recess formed in one of said members adjacent the open end thereof and opening in the direction of the second member, and by locking elements located in said recess and contiguous with said open end, said recess having a first part with a bottom portion positioned at a greater distance from said second member than the distance corresponding to the size of the locking elements in a direction transversally to the axial direction of said members, and a second part of said recess having a bottom portion decreasing its distance to said second member away from said open

end in the axial direction of said members and from the first mentioned bottom portion to a distance less than the distance corresponding to the size of the locking elements in said direction transversally to the axial direction of the members, said locking elements being free from locking engagement between said elements when located in said first part of recess and engaging said members for locking the members against displacement in at least one axial direction when located in said second part of recess, and an actuating element in the form of a sleeve snugly and slidably engaged in said one member for actuation axially therein and adapted to engage the locking elements from one axial direction and displace the locking elements between said parts of said recess, a first



shifter element in the form of an annular member secured to said second member adjacent one axial end thereof diameter smaller than said open end so as to be slidable therein and engageable through said recess in said one member and having a length adequate to allow direct contact with said locking elements from the opposite axial direction to displace said actuating element in one axial direction to permit said locking elements to assume a locking position and a second shifter element secured to said second member adjacent its opposite axial end spaced from said one member and engageable with said actuating element to displace it in an opposite axial direction whereby said locking elements are displaced to a non-locking position.

3,871,781

MOLE PLOUGH LINKAGES

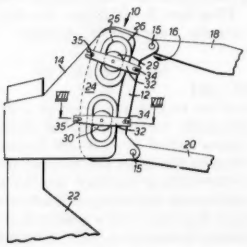
Terence Long, Leeds, England, assignor to Hudswell Yates Developments Limited, Leeds, England

Filed June 11, 1973, Ser. No. 369,080

Claims priority, application United Kingdom, Feb. 19, 1973, 8126/73

Int. Cl. B25g *3/38*

U.S. Cl. 403—121 **13 Claims**



1. A linkage arrangement for connecting first and second units comprising:

a first supporting member adapted to be secured to said first unit;

a second supporting member movable relative to the first supporting member and adapted to be secured to said second unit; and

constraining follower means for controlling said relative movement; the follower means comprising at least one roller, and for each roller, roller support means pivotally connected to said first supporting member and said second supporting member and supporting its respective roller for movement transversely of the linkage arrangement relative to each of the first and second supporting members upon said relative movement.

3,871,782

DEVICE FOR POSITIVELY RETAINING A BALL-SHAPED BEARING MEMBER IN A MATING BEARING SEAT

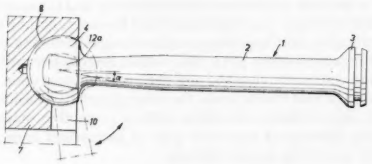
Roy Ingvar Mendel Johansson, Lilla Edet, and Roy S. G. Lagerqvist, Akarp, both of Sweden, assignors to Volvo Flygmotor Aktiebolag, Trollhattan, Sweden

Filed Dec. 26, 1973, Ser. No. 427,598

Claims priority, application Sweden, Dec. 22, 1972, 16933/72

Int. Cl. F16c *11/06*

U.S. Cl. 403—122 **1 Claim**



1. In apparatus for positively retaining a generally spherically shaped bearing member at the end of a piston rod in a mating bearing seat and being of the type wherein the depth of the bearing seat from its mouth plane is greater than its radius so that the angle of embracement of the bearing seat about the bearing member exceeds 180°, the improvement comprising:

two diammetrically opposed grooves formed in the outer surface of said bearing member and so located that their respective center lines lie in a plane which intersects the center of said bearing member and forms a small angle with a plane also passing through said center and containing the axis of said rod,

and a recess communicating with and extending radially from said bearing seat,

said recess having a depth below the mouth plane of the bearing seat and sufficient width to receive temporarily at least a substantial portion of the piston rod at its end adjacent said bearing member during the assembly and disassembly of said bearing member and bearing seat,

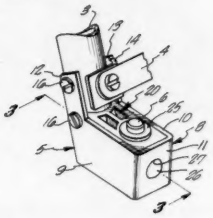
whereby said opposed grooves provide a predetermined sectional plane whose radius does not exceed the radius of the mouth of the bearing seat to thereby permit the bearing member to be readily inserted into said bearing seat while the bearing member and its associated piston rod are oriented so as to be almost parallel with the mouth plane but with said bearing member being positively retained in said bearing seat when the rod and bearing member are rotated to an operating position where a substantial angle is formed between said rod and said mouth plane.

3,871,783

CONNECTING DEVICE FOR LOAD BEARING MEMBERS

Paul A. Vogler, Westminster, Calif., assignor to "Strolee" of California, a division of U.S. Industries, Inc., New York, N.Y.

Filed June 13, 1974, Ser. No. 479,163
Int. Cl. F16b 9/00
U.S. Cl. 403—205 8 Claims



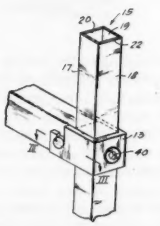
1. A connector device for connecting first and second elongate load bearing members the first of which is journaled in said device and the second of which is immovably affixed thereto such that its longitudinal axis intersects that of the first member at an acute angle, which device comprises a generally U-shaped elbow bracket having a forward component in which is received and secured an insert and rearwardly and upwardly extending arms adapted to embrace and secure said second member, the forward portion of said insert having a generally vertical bore to receive said first member in journaled relation, and the rearward portion of said insert having a declivity having a floor and sidewalls respectively configured to mate with the end and sides of said second member when it is embraced by said arms.

3,871,784

BRACKET SUPPORT STRUCTURE

James Van Horn, 185 Peter Rd., Libertyville, Ill. 60048

Filed Mar. 21, 1973, Ser. No. 343,520
Int. Cl. F16l 11/12
U.S. Cl. 403—236 2 Claims



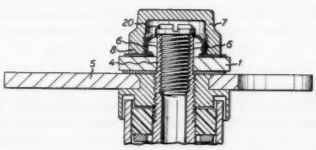
1. A frame structure comprising at least two first frame members and two second frame members, each frame member being elongated and being rectangular in cross section, the two first frame members having opposite ends thereof attached to two second frame members with an end face of each of the first frame members abutting a side surface of one of the second frame members and an opposite end face of each of the first frame members abutting a side surface of the other of said second frame members, projections extending through the first frame member adjacent each end thereof, the projections projecting from opposite side faces of the first frame members, the first frame members attached to the second frame members by brackets, said brackets being U-shaped and having two legs interconnected by a flat bight section, the legs terminating in free ends, first openings through the legs adjacent the free ends, the openings having throat openings thereto from an edge of the legs, the throat openings being narrower than the maximum dimensions of the first openings in a line from the free ends to the bight and being positioned closer to the bight than portions of the first openings, a set screw through the bight, said brackets dimensioned to be received around the second members with the free ends projecting beyond the side face of the second members abutted by the ends of the first members remote from the bight by an amount sufficiently large so that the projections of the first member abutting the associated second member can be received in the throat openings by moving the bracket relative to the first member when the bracket is in position around the second member and the free end of the first member abuts the side face of the second member, the first openings dimensioned to loosely receive the projections, the maximum dimension of said brackets, from an inside face of the bight to the most remote wall of the first opening being greater than the dimension from the most remote surface of the projections of an abutting first member and the wall of the abutted second member opposite the surface of the bight when the first member abuts the second member whereby the bracket and an associated first member are movable along the second member after insertion of the projections into the first opening through the throat opening and fastenable at any position therealong by the set screw.

3,871,785

NUT LOCKING DEVICES

Ake Eugen Murvall, Svangsta, Sweden, assignor to Abu Aktiebolag, Svangsta, Sweden

Filed June 22, 1973, Ser. No. 372,617
Claims priority, application Sweden, June 29, 1972, 8546/72
Int. Cl. F16d 1/06
U.S. Cl. 403—259 7 Claims



4. A locking device comprising a crank having a retaining nut on a threaded end portion of the drive shaft of a fishing reel, said threaded end portion having two diametrically positioned unthreaded, axially extending parallel flat surfaces and said crank having an aperture therein corresponding to the cross-section of said shaft end portion to receive the latter in driving engagement therewith, said crank when mounted in such driving engagement being fixed to said shaft by means of said nut mounted on said end portion; a locking washer having a flat base portion with a central aperture of a shape adapted to permit mounting the locking washer on said shaft end portion with said flat base portion placed between the crank and the nut when the latter is mounted on said shaft end portion; the aperture in the locking washer having a shape adapted to hold the locking washer in a non-rotatable position on said shaft end portion, said aperture in the washer having two diametrically positioned circular end portions and an intermediate portion the central part of which is flanked at opposite edges thereof by two diammetrically positioned identical tongues projecting substantially perpendicularly from the plane of said flat base portion of the locking washer and having each an outer convex surface, an inner concave surface and a radially inwardly extending outer end portion, the outer end portions of said tongues being adapted to bear against said two diammetrically positioned flat surfaces on the threaded shaft portion with each of the tongues positioned between the nut and a corresponding one of said flat surfaces of said shaft portion, and wherein the maximum distance between the

outer peripheral surfaces of the tongues on a washer diameter is somewhat greater than the inner diameter of the nut thread, such that said tongues, when the nut is tightened on the threaded shaft portion, will be pressed inwardly by the threads of the nut thereby to form a frictional connection between the nut and the threaded part.

3,871,786

SHAFT COUPLING

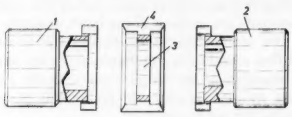
Sven Beinhard Rennerfelt, Louhagegangen 4, Gothenburg, Sweden

Filed Feb. 5, 1973, Ser. No. 329,638

Claims priority, application Sweden, Feb. 7, 1972, 1363/72

Int. Cl. F16d *1/12*

U.S. Cl. 403—300 **6 Claims**



1. In an assembly for coupling two shafts disposed at least substantially in alignment with each other, the combination of: a pair of shaft-associated sections having spaced, mutually opposed end portions; and

an intermediate section disposed between and joining said shaft-associated sections; wherein the improvement comprises:

an end portion on each of shaft-associated sections, each such end portion including a body having a series of external gear teeth integrally joined to the associated body for a portion only of the widths of the gear teeth whereby to project axially beyond said associated body and to define open spaces between adjacent pairs of gear teeth; said intermediate section including an annular body having external gear teeth integrally joined to said annular body for a portion only of the widths of the gear teeth and projecting axially beyond said annular body on opposite sides thereof and defining two sets of open spaces between adjacent pairs of teeth, one on one end of said annular body and the other on the other end thereof, the projecting base portions of at least those axially projecting portions of the gear teeth on opposite sides of said intermediate section being undercut by an amount sufficient to allow axial interdigitation between such axially projecting portions and the axially projecting gear teeth portions of the respective shaft-associated sections, said annular body of the intermediate section being of sufficiently thin radial thickness to permit deformation of said annular body into eliptical form.

3,871,787

JOINT STRUCTURE FOR CONCRETE MATERIALS AND THE LIKE

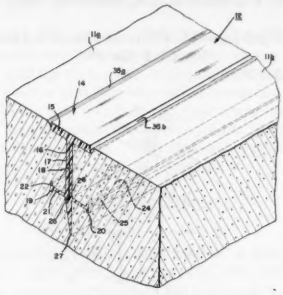
William James Stegmeier, 1021 C Shary Cir., Concord, Calif. 94520

Filed Oct. 30, 1973, Ser. No. 411,067

Int. Cl. E01c *11/02*

U.S. Cl. 404—48 **24 Claims**

1. A joint structure adapted to be embedded in concrete materials and the like to accommodate relative displacements of sections thereof bounded in common by such joint, comprising: a longitudinally extending generally T-shaped channel having a transverse flange defining a topwall adapted to be disposed in generally planar relation with the surfaces of such sections and having also a web extending downwardly from said flange, said web being divided intermediate the transverse edges thereof into web components disposed in side-by-side juxtaposition and displaceable transversely relative to each other, means effective to secure each of said web components to the associated section for movement therewith; a cap removably secured to said channel in generally overlying rela-



tion with said flange; and a strip of protective material intermediate said flange and cap to protect the surface of the latter.

3,871,788

VIBRATING ROLLER

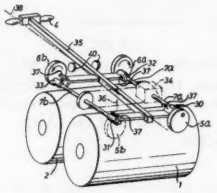
Alan Barsby, Gainsborough, England, assignor to Marshall-Fowler Limited, Gainsborough, England

Filed Feb. 1, 1973, Ser. No. 328,627

Claims priority, application United Kingdom, Feb. 4, 1972, 5301/72

Int. Cl. E01c *19/38*

U.S. Cl. 404—117 **5 Claims**



1. A steerable vibrating roller, having a center line, particularly for rolling ground surfaces or the like, comprising a frame; at least a front and a rear ground-engaging roll having parallel axes and being rotatably attached to said frame; a spaced-apart pair of out-of-balance masses rotatably mounted on said frame; means to rotate said masses attached to said masses; and means to vary the phase relationship between said rotating masses located on said frame, said masses being so positioned on said frame that as the phase relationship between said masses changes, a resulting force is generated by said masses which acts to turn said frame about a vertical axis to thereby steer said roller.

3,871,789

VERTICAL ROTATABLE CENTRIFUGAL PUMP

Herman Johannes Lameris, Hengelo, Netherlands, assignor to Koninklijke Machinefabriek Stork B.V., Hengelo, Netherlands

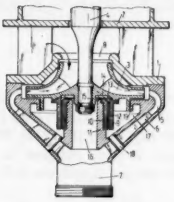
Filed June 29, 1973, Ser. No. 375,023

Int. Cl. F04d *29/04;* **F01d** *25/16*

U.S. Cl. 415—112 **6 Claims**

1. A vertical rotatable centrifugal pump for pumping fluid metals, more particularly sodium, comprising a rotor journalled in a hydrostatic bearing in which the pumped fluid is utilized as a bearing fluid characterized in that the rotor is provided with an auxiliary impeller whose suction side communicates directly with the pressure space of the pump and whose pressure side communicates with the hydrostatic bear-

ing feed and in that the delivery side of the bearing communicates with a low pressure space which communicates through



aperatures in the blades of the diffuser with the suction space of the pump.

3,871,790

ARRANGEMENT FOR DRIVING A FLUID-CIRCULATING PUMP

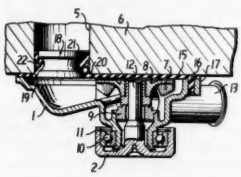
Jean Rameau, Sannois, France, assignor to Regie Nationale Des Usines Renault, Boulogne-Billancourt and Societe Dite Des Automobiles Peugeot, Paris, both of France

Filed Mar. 5, 1974, Ser. No. 448,241

Claims priority, application France, May 14, 1973, 73.17303

Int. Cl. F04d *29/40*

U.S. Cl. 415—219 C **7 Claims**



1. An arrangement for driving a fluid-circulating pump comprising:

a housing;

a pulley wheel associated with said housing and being rotatable about a first axis;

tensionable means for driving said pulley wheel about said first axis;

said housing having associated therewith means defining a fluid orifice the axis of which is offset and parallel to said first axis of said pulley; and

means for permitting said housing to be pivoted about said orifice axis,

whereupon said pulley is likewise pivoted about said orifice axis so as to adjust the tension within said tensionable driving means.

3,871,791

BLADE FOR FLUID FLOW MACHINES

Kenneth Ronald Guy, and Robert Burns Hood, both of Bristol, England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Feb. 20, 1973, Ser. No. 333,659

Claims priority, application Great Britain, Mar. 9, 1972, 11078/72

Int. Cl. F01d *5/14, 5/22*

U.S. Cl. 416—193 **4 Claims**

1. A fan rotor for gas turbine engines comprising:

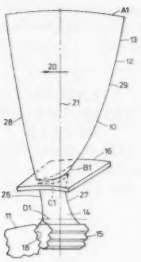
a disc having an axis of rotation,

fan blades connected to the disc and extending radially from the periphery thereof,

means defining a wall extending circumferentially about said axis in spaced apart relationship to the periphery of the disc,

each of said blades comprising

an aerofoil of given camber and twist extending radially outwardly of said wall and having a radially inner end adjacent said wall, the chord of said aerofoil generally increasing radially outwardly,



a shank extending between the inner end of the aerofoil and a location adjacent the periphery of the disc, said shank having a radially outer end of a cross-section similar in stagger, camber and aerofoil shape to that of the inner end of the aerofoil, and the camber of the shank gradually progressively decreasing from the outer end to the inner end thereof so as to be zero at the inner end of the shank,

and means provided at the radially inner end of the shank for connecting the blade to the disc.

3,871,792

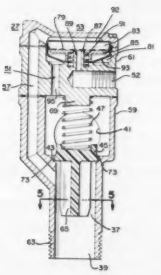
PUMP SYSTEM AND VALVE ASSEMBLY THEREFOR

Darrell D. Gritz, Little Rock, Calif., assignor to Jacuzzi Bros. Incorporated, Little Rock, Calif.

Filed Nov. 28, 1973, Ser. No. 419,687

Int. Cl. F04b *49/00*

U.S. Cl. 417—38 **13 Claims**



1. A pump system comprising a pump, an electric motor in drive connection with said pump, a service line, a service valve in said service line, a pressure switch in electric circuit with said motor, and a control valve assembly comprising a valve housing having an input opening for flow connection thereto of said pump, a discharge opening for flow connection to said service line, and a main flow passageway interconnecting said input opening and said discharge opening, a main valve spanning said main passageway, means biasing said main valve toward closing position, a first auxiliary passageway flow

connecting at one end with said main passageway on the downstream side of said main valve and terminating in an opening in said housing for hydraulic pressure connection to said pressure switch, means coupling said pressure switch to said valve housing at said last opening, a pilot valve assembly spanning said first auxiliary passageway and including a valve seat and a valve means normally biasing said pilot valve toward open condition, and a second auxiliary passageway, said second auxiliary passageway flow connecting at one end to said main passageway on the upstream side of said main valve and terminating at said pilot valve in pressure opposing relationship to said biasing means, whereby development of hydraulic pressure against said valve in excess of any opposing pressure against said valve will close said valve and block said first auxiliary passageway.

3,871,793

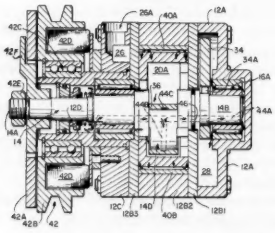
AUTOMOTIVE REFRIGERATION COMPRESSOR MODULE

John W. Olson, Jr., 2723 National Pl., Garland, Tex. 75040

Filed Dec. 28, 1973, Ser. No. 429,635

Int. Cl. F04b *39/12*

U.S. Cl. 417—273 **17 Claims**



1. A compressor for automotive refrigeration system comprising:

at least one compressor module having a housing, said housing including a first housing section defining a substantially rectangular compression chamber bounded on each end by second and third housing sections defining discharge and suction chambers internally thereof, respectively;

a hollow substantially rectangular piston means in said compression chamber of a said module for reciprocation therein;

suction port means and discharge port means formed within said housing and interconnencting said compression chamber of a said module at opposite ends thereof with said suction and discharge chambers, respectively;

suction valve means within said compression chamber of a said module at said opposite ends thereof opening and closing said suction port means in response to reciprocation of said piston means;

discharge valve means within said discharge chamber of a said module opening and closing said discharge port means in reverse order from said suction port means in response to reciprocation of said piston means;

a shaft seal extension on said housing;

a crankshaft extending through said housing and said piston means from a point external to said shaft seal extension to at least a point internal of said suction chamber;

first bearing means in said second housing section and second bearing means journalling said crankshaft for rotation in said housing;

a first counterweight means mounted on said crankshaft for rotation therewith in said suction chamber;

a second counterweight means and integral drive clutch means mounted on the outboard end of said crankshaft externally of said shaft seal extension;

said crankshaft having an eccentric portion rotatable within said piston means; and

drive block means mounted on said eccentric portion within said piston means and imparting alternating thrust thereto to reciprocate said piston means in said compression chamber between said two ends thereof in response to rotation of said crankshaft means.

3,871,794

CORRECTION DEVICE FOR THE DELIVERY PER REVOLUTION OF A DISTRIBUTING INJECTION PUMP AND PUMP EQUIPPED WITH THIS DEVICE

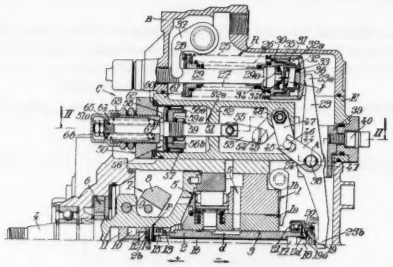
Jean Leblanc, Lyon, France, assignor to Societe Industrielle Generale De Mecanique Appliquee S.I.G.M.A., Venissieux, France

Filed June 12, 1973, Ser. No. 369,179

Claims priority, application France, June 19, 1972, 72.22041

Int. Cl. F04b *49/00;* **F02d** *1/04*

U.S. Cl. 417—282 **6 Claims**



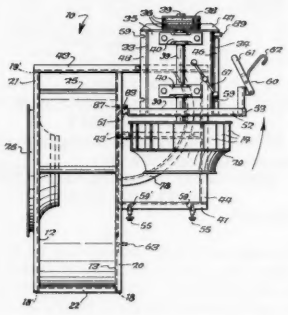
1. Correction device for the delivery per revolution of a distributing rotary injection pump for an internal combustion engine, which pump comprises: a pump casing, a pump working chamber, a fixed body, and a rotary distributor driven inside said body by a substantially coaxial shaft, which shaft is itself driven by the engine supplied by the pump, delivery means in communication with said pump working chamber and said rotary distributor, said rotary distributor comprising distributing passages inclined to its longitudinal direction and cooperating with said delivery means for varying the delivery per revolution of the pump upon longitudinal displacement of the distributor; a regulator sensitive to the rotary speed of the drive shaft for controlling the longitudinal displacements of the distributor, the distributor being subject, on the one hand, to the action of the regulator through thrust means and, on the other hand, to the contrary action of elastic return means through a transmission lever mounted on pivoting means borne by a casing shielding the pump, said pivoting means comprising a pivot borne by said casing, on which said pivot is mounted in an eccentric manner, a pivoting axle constituting the pivot axis of said lever so as to enable displacement of the pivot axis of the lever upon rotation of said pivot, said correction device comprising a fluid pressure responsive jack with a rod to control the rotation of the pivot, said jack being situated between said distributor and the elastic return means and substantially between planes perpendicular to the axis of the distributor and passing through the ends of said distributor, the axis of the jack being substantially parallel to the axis of the distributor, linking means between the rod and the pivot, said linking means comprising an axle borne by said casing and two radial arms respectively fast in rotation with the ends of the axle, said arms being respectively operatively coupled with the pivot and with the rod.

3,871,795

FAN CONSTRUCTION

Robert T. Habdo, Tonawanda, and William P. Burger, Buffalo, both of N.Y., assignors to Buffalo Forge Company, Buffalo, N.Y.

Filed Apr. 18, 1973, Ser. No. 352,316
Int. Cl. F04b *17/00*
U.S. Cl. 417—360 **9 Claims**



1. A fan construction comprising a fan housing, a door, pivot means pivotally mounting said door on said fan housing, a fan wheel journalled on said door for rotation within said fan housing when said door is closed, means mounted on said door for driving said fan wheel, a first rigid frame section fixed to said fan housing, a second rigid frame section fixed to said door, fastener means for selectively rigidly securing said first and second rigid frame sections to each other when said door is closed to thereby securely mount said fan and said means for rotating said fan relative to said housing, said means for rotating said fan including motor means, roller means operatively interposed between said first and second rigid frame sections for permitting said second rigid frame section to roll relative to said first rigid frame section during the opening of said door, said roller means comprising a wheel on said second rigid frame section and a track on said first rigid frame section, and means for lifting said second rigid frame section from said first rigid frame section so as to enhance relative movement therebetween during opening of said door.

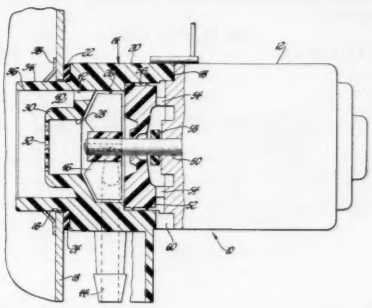
3,871,796

PUMP ASSEMBLY

Walter Edward Mack, Westland, Mich., assignor to McCord Corporation, Detroit, Mich.

Filed Nov. 15, 1973, Ser. No. 409,777
Int. Cl. F04d *13/02*
U.S. Cl. 417—423 **10 Claims**

1. A pump assembly of the type for insertion into an opening in a fluid reservoir comprising; a housing, said housing having a shoulder for overlapping the periphery of an opening in a fluid reservoir, said housing defining an impeller chamber, an inlet passage means extending from said impeller chamber in the forward straight ahead direction and disposed inwardly



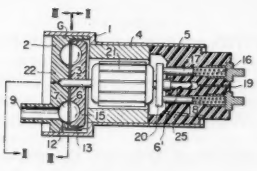
of said shoulder, a filter disposed in said inlet passage means inwardly of said shoulder.

3,871,797

FUEL PUMP FOR AUTOMOBILES

Osamu Igarashi, and Yukio Hohsho, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 20, 1973, Ser. No. 343,037
Claims priority, application Japan, Mar. 22, 1972, 47-28161
Int. Cl. F04b *17/00*
U.S. Cl. 417—423 **7 Claims**

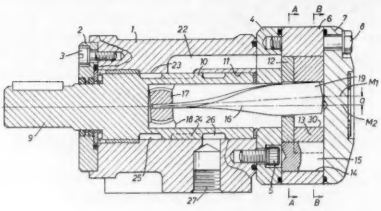


1. A fuel pump for automobiles, suspended in a fuel tank and used for supplying fuel in the fuel tank to the carburetor of the like, comprising a casing having an inlet port and an outlet port at the opposite ends of an annular groove formed therein, a runner having formed at an end face thereof a plurality of annularly disposed chambers opposed by the annular groove said casing and having a shaft press-fitted into the center thereof, means for axially movably supporting one end of said shaft in said casing, a D. C. motor having an armature integral with said shaft, another shaft provided on that side of said D. C. motor opposite to said first shaft, means for axially movably supporting another shaft in a bracket, spring means for urging said armature towards the runner through brushes for said D. C. motor, passage means provided in the casing for leading fuel from the outlet port to the backside of the runner, and further passage means for discharging the fuel from the backside of the runner to the outside of the pump through the interior of the D. C. motor and neighboring portions of the brushes.

3,871,798
ROTARY AND ORBITING PISTON MACHINE WITH INTERNAL SHAFT

Bodo Berlich, Obertshausen, Germany, assignor to Danfoss A/S, Nordborg, Denmark

Filed Dec. 3, 1973, Ser. No. 420,936
Claims priority, application Germany, Dec. 2, 1972, 2259117
Int. Cl. F04c *29/00*
U.S. Cl. 418—39 **3 Claims**



1. A gerotor type rotary piston machine comprising an internally toothed ring gear having an axis and having teeth in the form of rollers equal in length to the width of said ring gear, a cooperating externally toothed star gear having fewer teeth than said ring gear disposed eccentrically relative to said ring gear axis, said star gear having rotational movement about its own axis and orbital movement about the axis of said ring gear with the teeth of said gears intermeshing in sealing engagement to form expanding chambers on one side of a line of symmetry and contracting chambers on the other side of said line during relative movement between said gears, wall means on opposite sides of said ring gear, an insert member disposed internally of said ring member and having recesses for receiving said rollers, said star gear and said insert member having a combined thickness equal to the width of said ring gear, a drive shaft, drive means between said star gear and said drive shaft for rotating said drive shaft at the rotating speed of said star gear.

3,871,799
ROTARY-PISTON MOTOR WITH IMPROVED CYLINDER CHAMBER MOVING SEALS

Harald Vogt, Frankfurt-Unter-Hederbach, and Walter Moller, Frankfurt am Main, both of Germany, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

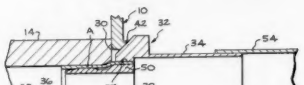
Filed Oct. 5, 1973, Ser. No. 404,363
Claims priority, application Germany, Oct. 20, 1972, 2251504
Int. Cl. F03c *3/00;* **F01c** *21/04*
U.S. Cl. 418—178 **6 Claims**

1. In rotary-piston motor having a housing with a shaped inner circumferential surface and a rotor assembly mounted to rotate within said housing, the combination comprising:
a plurality of blades and a corresponding plurality of slots in said rotor assembly, said slots supporting said blades in substantially radial alignment with radially sliding freedom in a fluid medium, said blades having a maximum radial stroke from their most radially outward position to their radially innermost position
means for exerting a resilient force radially outward tending to produce abutment of an outer edge of each of said blades against said shaped inner housing surface;
and means comprising a plurality of recesses of relatively small depth and diameter along a lateral face of each of said blades in sliding contact with a corresponding inside slot face for retaining a film of said fluid between said slot and blade faces forming a band on the outward extremity of said blade faces, the balance of said blade faces being relatively smooth, whereby when said blades are in their radially innermost positions said outward bands are in sliding contact with their corresponding inside slot faces and when said blades are in their most radially outward positions said outward bands are in substantially full contact with said fluid medium radially outwardly of the rotor shafts.

3,871,800
HERMETICALLY SEALED COMPRESSOR SUCTION TUBE ASSEMBLY

Curtis R. Slayton, Fern Creek, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 11, 1974, Ser. No. 449,720
Int. Cl. F04b *17/00*
U.S. Cl. 418—248 **3 Claims**

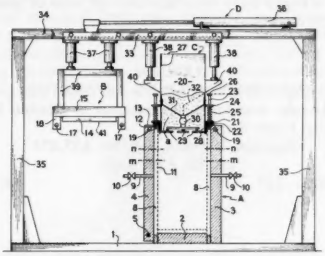


1. A hermetic compressor unit comprising:
a casing including a side wall;
a compressor including a cylinder block positioned in said casing and having an outer surface adjacent the inner surface of said casing wall;
a passage in said block opening into said outer surface;
said casing having an opening aligned with and larger than said passage;
a suction tube connector including an end portion extending into said opening in axial alignment with said suction passage, and having an opening larger than said passage;
a tubular sleeve member being of greater ductility than the suction tube connector, the sleeve having a reduced end portion extending into said passage and an enlarged portion extending into the end portion of said suction tube connector; and
a tubular fitting having an end portion extending into said reduced end portion of said sleeve member and a shoulder portion extending into said enlarged portion of said sleeve member to simultaneously radially compress said sleeve member in said passageway and said end portion of said suction tube connector to seal the casing and suction tube connector to the compressor cylinder block.

3,871,801
MACHINE FOR ENCLOSING EXPANDED PLASTIC MATERIAL FOR MOULDING PARTS

Rudolf C. Buchmann, Mannheim-Feudenheim, Germany, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Nov. 24, 1972, Ser. No. 309,028
Claims priority, application Germany, Nov. 29, 1971, 2159005; Dec. 2, 1971, 2159809; Dec. 2, 1971, 2159794
Int. Cl. B29d *27/00*
U.S. Cl. 425—4 R **15 Claims**



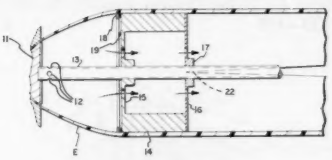
1. A machine for enclosing particles of preexpanded plastics material for subsequent moulding of a part, said machine comprising in combination: a stand, a moulding box supported in a fixed position relative to said stand and having a moulding cavity and a large upper charging opening; a closing cover capable of closing said charging opening in a fluidtight manner; means for locking said cover in the closing position; a mould charging device having a bin whose capacity is at least equal to that of said moulding cavity and has a lower pouring opening having a shape and dimensions substantially corresponding to those of said upper charging opening, said cover and said charging device being vertically movable relative to the moulding box and stand and said bin being capable of descending partly into the moulding cavity; first shifting means for shifting the cover and the charging device vertically with respect to the stand and selectively toward and away from and coaxially of the moulding cavity; at least one of the elements consisting of the cover and the charging device being movable transversely of the moulding box to allow the other of said elements to be shifted toward the moulding box by the first shifting means; closure means for said pouring opening, said closure means being capable of being withdrawn to allow passage for said material substantially throughout said pouring opening to allow the material to fall into said moulding cavity; means for selectively withdrawing said closure means and putting said closure means in their closing position, said closure means being in their closing position capable of compressing said material upon descent of said bin into the mould cavity.

3,871,802
DRESSING RING FOR TUBULAR EXPANDED POLYSTYRENE COOLING MANDREL

Maurice W. Blackwelder, Dix Hills, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 4, 1973, Ser. No. 366,265
Int. Cl. B29d *23/04*
U.S. Cl. 425—72 **3 Claims**

1. In apparatus for producing a web of expanded polystyrene comprising an extruder for extruding a tubular extrudate, means for expanding the extrudate and a cooling mandrel over which the expanded extrudate is drawn in surface to surface contact therewith, the improvement comprising: a contacting ring for dressing the inside surface of the extrudate which is thin in the longitudinal direction relative to the mandrel, which has an extrudate-contacting outside surface which is positioned to contact the extrudate at a location where the extrudate has reached its final diameter, which is disposed

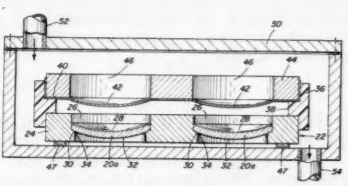


substantially concentrically, with the mandrel and which is spaced longitudinally upstream of the cooling mandrel.

3,871,803
APPARATUS FOR PRODUCING AN OPTICAL MOLDING PLAQUE

John O. Beattie, Riverside, Calif., assignor to Beattie Development Company, Stamford, Conn.

Division of Ser. No. 210,488, Dec. 21, 1971, Pat. No. 3,806,079, which is a continuation-in-part of Ser. No. 841,926, July 15, 1969, abandoned. This application Dec. 3, 1973, Ser. No. 420,819
Int. Cl. B29c *1/02*
U.S. Cl. 425—175 **10 Claims**



1. Apparatus for molding a replicate plaque from plastic monomer for use in simultaneously molding a plurality of plastic optical elements comprising:

a. a first support plate;

b. means on said first support plate for defining a mold surface, said mold surface including a plurality of master surfaces to be negatively reproduced on said replicate plaque;

c. a second support plate;

d. a flexible member having inner and outer surfaces supported by said second support plate, said flexible member having a plurality of sectors formed thereon, the outer surfaces of said sectors having the same general shape as said master surfaces;

e. means for supporting said first and second support plates in spaced relationship with said plurality of sectors being in substantial alignment with said plurality of master surfaces for defining a mold cavity between the inner surface of said flexible member and the mold surface of said first support plate within which said replicate plaque may be molded;

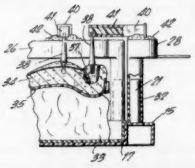
f. means for filling said mold cavity with said plastic monomer; and

g. means for applying a positive pressure to the outer surface of said flexible member during the molding of said plaque to cause said sectors to deform and maintain said plaque in intimate contact with said master surfaces during the molding thereof.

3,871,804
DENTAL RESTORATION JIG

Abraham Cooper, 1362 Gibson St., Far Rockaway, N.Y. 11694

Filed July 16, 1973, Ser. No. 379,856
Int. Cl. A61c 9/00
U.S. Cl. 425—175 5 Claims

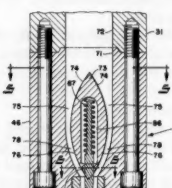


1. A jig for casting a model of a dental impression comprising a base, a plurality of vertically upstanding positioning pins on said base, a dental impression portion on said base within the said pins, (at least one) a plurality of table (member) members each comprising an arcuate support bar and downwardly extending hollow tubular members integral with said arcuate bar and receivable upon the positioning pins on the base, for selective placement of the tables to accommodate impressions having different sizes at least one dowel pin holder receivable upon the arcuate support, a dowel member carried by and depending from the dowel holder and extending for a portion of its length into the dental impression whereby after the dental impression, the dowel holders and the dowels have been adjusted to their proper relationship the table can be removed, the casting material poured and the table thereafter replaced in proper orientation before the casting material hardens.

3,871,805
RECIPROCATING SCREW INJECTION MOLDING MACHINE CYLINDER HEAD WITH INTEGRAL SPREADER AND AUTOMATIC NOZZLE

Arthur W. Jacobs, 5994 Columbus Rd., North Olmsted, Ohio 44070

Filed Apr. 26, 1973, Ser. No. 354,655
Int. Cl. B29f 1/03
U.S. Cl. 425—245 NS 9 Claims

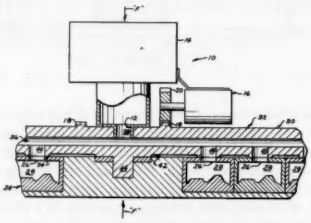


4. A spreader, valve, and nozzle assembly for a reciprocating screw type injection molding machine comprising a cylinder head adapted to be secured at the end of the heating cylinder of such machine and having a passage at one end registering with the bore of said heating cylinder and a nozzle at the other end having an orifice through which plasticized material flows through said passage into a mold engaged by the said nozzle; a spreader integral with said head and defining with said passage two flow passages for transforming a cylindrical body of plasticized material into two segmental streams of progressively decreasing area as the plasticized material flows toward said nozzle; said spreader being hollow and being communicated with the atmosphere via a lateral passage extending through said head between said segmental flow passages; said spreader having a central axial bore which is coaxial with said orifice and which leads into said spreader; a valve member slidably sealed in said bore; said nozzle having a valve seat smaller than said bore; and spring means in said spreader biasing said valve member into engagement with said seat except when the pressure of the plasticized material acting on the differential area of said bore and seat is sufficient to overcome the biasing force of said spring, at which time, said valve member is urged away from said seat for flow of plasticized material through said orifice.

3,871,806
INJECTION MOLDING APPARATUS

Carl V. Leunig, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 28, 1974, Ser. No. 437,474
Int. Cl. B29c 5/00
U.S. Cl. 425—247 6 Claims



1. In injection molding apparatus having a plasticator, a plasticator nozzle, and a mold system having a continuous planar surface interrupted only by a plurality of sprue openings opening at the planar surface for receiving material from the nozzle via the sprue openings, the improvement comprising:

a runner block having first and second surfaces, at least one channel extending laterally within the block, a feed opening extending through the block in communication with the channel, and at least a plurality of spaced-apart secondary openings each extending through the block between the second surface and said channel, said feed opening receiving the nozzle, and said second surface of the block being planar and slidably movable along the planar surface of the mold system about a preselected axis between at least a first position at which at least one of the secondary openings is in communication with an associated sprue opening and at least a second position wherein said secondary openings are sealed by mating engagement with the uninterrupted portion of said planar surface; and

means for slidably moving the block along the mold system and about the axis between at least the first and second positions.

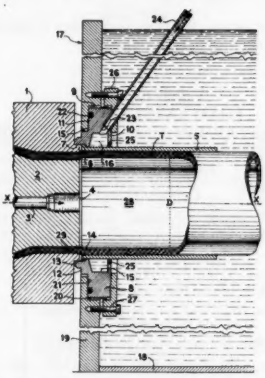
3,871,807
DEVICE FOR FORMING TUBES OF THERMOPLASTIC MATERIAL BY EXTRUSION

Jean-Pierre Meyniel, Vauvert, and Jean-Louis Roulle, Nimes, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Jan. 3, 1973, Ser. No. 320,783
Claims priority, application France, Jan. 12, 1972, 72.00949
Int. Cl. B29d 23/03, 23/04
U.S. Cl. 425—326 R 6 Claims

2. A device for forming tubes of thermoplastic material comprising a cooling tank for containing a bath of cooling

liquid, a cold die head comprising tubular means having an upstream end and a downstream end and defining a cylindrical throughway passage, second means defining with said tubular means an annular chamber surrounding a portion of said tubular means adjacent said upstream end, said tubular means being combined with a wall of said tank adjacent said upstream end and putting the interior of said tank in communication with the exterior of said tank, said upstream end of said tubular means being for combination with an annular output end of an extruder so as to put said passage in axial alignment with said extruder annular output end for receiving the tubular extruded material from said extruder, said second means having a downstream end remote from said upstream end of said tubular means and said tubular means having a part extending beyond said downstream end of said second means so that said part of said tubular means is directly exposed to said



bath of cooling liquid, said passage being for communication with a source of fluid under pressure for applying the tubular extended material against said tubular means, means for putting said chamber in communication with a source of cooling liquid so as to cool said extruded material indirectly through said portion of said tubular means, means defining a series of equally-spaced orifices disposes around and adjacent said tubular means and adjacent said downstream end of said second means for putting said chamber in communication with the interior of said tank and producing jets of said cooling fluid which issue from said chamber and create turbulence in said bath of cooling liquid around said part of said tubular means, said chamber having a length axially of said tubular means which length is a minor fraction of the diameter of said passage and a minor fraction of the axial length of said part of said tubular means.

3,871,808

APPARATUS FOR PRODUCING SUBSTANTIALLY UNIFORM CALENDERED MATERIAL

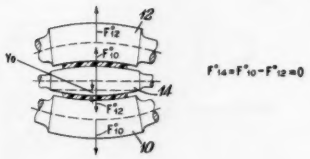
Fred H. Ancker, Bound Brook, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 870,698, Oct. 13, 1969, abandoned, which is a division of Ser. No. 759,013, Sept. 11, 1968, Pat. No. 3,499,957, which is a continuation-in-part of Ser. No. 398,182, Sept. 22, 1969, abandoned. This application Jan. 13, 1972, Ser. No. 217,679

Int. Cl. B29c *15/00;* **B29d** *7/14*

U.S. Cl. 425—367 **2 Claims**

1. In calendering apparatus for the production of thermoplastic film having at least three coplanar, cooperating calender rolls suspended in bearing mountings in opposed side frames, the improvement which comprises a crowned penultimate roll interposed between cylindrical ultimate and antepenultimate rolls to form the three rolls of said coplanar system, said penultimate roll being crowned to provide an equidistant gauging nip when said penultimate roll is undeflected and said ultimate roll is at its maximum deflection and having a flexural ridigity ratio in respect to said ultimate roll of between about 0.03 and 0.75, means for adjusting the separation of said rolls, bearings for said penultimate roll comprises of a



main normal clearance bearing disposed about each neck of said roll and two auxiliary adjustable bearings proximate to and disposed about each side of each of said main bearings providing pullback means adapted to force said roll necks into a stable position against each of said main bearings; and bearing housings for said penultimate roll being attached to the opposed side frames through self-aligning spring mountings.

3,871,809

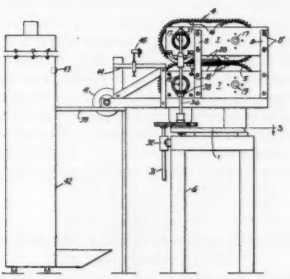
EXTERNAL SWIVEL CONNECTIONS FOR CORRUGATING MACHINE

James W. Williams, 3029 Country Club Dr., Costa Mesa, Calif. 92626

Filed Jan. 7, 1974, Ser. No. 431,227

Int. Cl. B29c *15/00*

U.S. Cl. 425—370 **7 Claims**



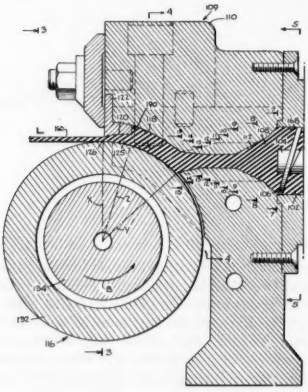
1. In a corrugating machine, the combination comprising
a. a series of longitudinally axially elongated rods and two generally parallel chains,
b. means interconnecting the ends of the rods with chain links of the two chains so that the rod ends can swivel relative to the links to which they are connected, and including a universal joint between each rod end and associated link, the joint including a member having axially slidable telescopic connection with the rod end and wherein said telescopic connection is defined by a bore in the rod end, the member rotatably received in the bore.

3,871,810

EXTRUDER AND ROLLER-DIE COMBINATION

Paul Geyer, Detroit, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Filed Nov. 20, 1972, Ser. No. 308,161
Int. Cl. B29f *3/012*
U.S. Cl. 425—374 **2 Claims**



1. Apparatus for forming an elastomeric strip, comprising a roller, a stationary surface confronting and in spaced relation converging toward said roller, said surface and roller cooperatively defining a wedge chamber terminating in a restriction orifice, extrusion means for advancing elastomeric material under pressure to said wedge chamber, and means for defining a transition chamber intercommunicating said extrusion means and said wedge chamber, said transition chamber in one plane of cross-section having a converging portion proximate to and directed away from said extrusion means and a diverging portion remote from and directed away from said extrusion means, said transition chamber in successive downstream planes of cross-section normally of the first said plane having a medial portion which at least in said converging portion progressively narrows at a greater rate than do the respective opposite end portions of said transition chamber in said successive planes, said medial portion of said transition chamber in said successive planes passing through said diverging portion progressively widening in a direction normally of the direction it narrows in said converging portion.

3,871,811

APPARATUS FOR APPLYING HEATING AND COOLING MEDIA TO MOLD PLATE

Martin J. Barry, Westport, Conn., and Elon J. Nobles, Minnetonka, Minn., assignors to Edward J. Cabic, Falls Church, Va., a part interest

Filed June 25, 1973, Ser. No. 373,138
Int. Cl. B29c *3/00*
U.S. Cl. 425—407 **10 Claims**

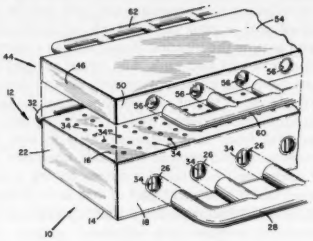
1. A mold plate adapted for applying heating and cooling fluids to a layer of plastic material to form a plastic panel comprising:

a. a pair of spaced apart plates consisting of a first plate and a second plate wherein the first plate which engages the plastic material is made of a material having good heat transfer properties;

b. wall means connecting the edges of said plates to form a fluid-tight chamber between said plates;

c. inlet and outlet means within said walls to allow a heat-transfer media to enter and exit from said chamber; and

d. a plurality of open ended tubes extending between and into the two plates, said tubes being in a fluid-tight relation with said plates so that the media within said chamber cannot escape through said plates to provide additional fluid to the face of the mold.

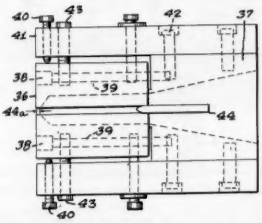


3,871,812

FOAM EXTRUSION DIE

Arthur L. Phipps, 6204 Raymond Ct., Erie, Pa. 16505

Filed Aug. 2, 1972, Ser. No. 277,407
Int. Cl. B29d *7/04*
U.S. Cl. 425—466 **20 Claims**



1. An extrusion die for extruding a homogeneous distribution of foaming polymeric material comprising, having the property of changing shape after it leaves said die,

two spaced lips fixed to said die and extending therefrom disposed substantially in two parallel planes,

the edge of said lips remote from said die defining an exit passage for said material,

said lips extending beyond the end of said die in spaced relation to each other providing an open space therebetween for material to move laterally relative to said lips,

means supporting said lips on said die,

and means to adjust the position of said lips relative to each other to control the shape of said passage,

said exit passage being generally in the shape of a bow tie having inwardly curving sides,

said lips are movably connected to said die to swing about spaced parallel axes whereby said lips may be moved to converge toward each other or to diverge from each other,

and means to hold said lips selectively in converging position or in diverging position.

3,871,813

MOLD MEMBER FOR CONTACT LENS CONSTRUCTION

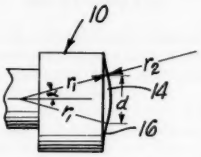
Quido A. Cappeli, Bronx, N.Y., assignor to Danker & Wohlk, Inc., Uniondale, N.Y.

Division of Ser. No. 193,380, Oct. 28, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,091
Int. Cl. B29d *11/00*
U.S. Cl. 425—469 **1 Claim**

1. A mold for forming the inner surface of a plastic corneal-type contact lens such that the inner surface includes a semi-spherical central cornea engaging portion and a slightly con-

cave outer annular cornea engaging and limbus bridging portion, said mold comprising:

a mold member having an end face including a central semi-spherical convex portion of radius r_1 having substantially the contour of the central portion of the cornea and an outer slightly concave annular portion forming the



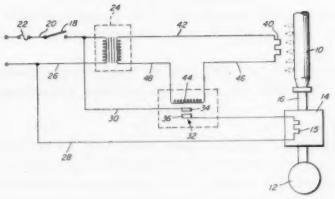
periphery of said end face and of radius r_2 greater than and colinear to r_1, and a junction of curves defined by r_1 and r_2 defining a surface having substantially the contour of the outer annular generally hyperbolic portion of the cornea and bridging the limbus just to the sclera of the eye, the diameter of said portion of radius r_1 being of the order of one-half the diameter of said end face.

3,871,814

ELECTRIC IGNITION SYSTEM

Nalini R. Das, Bethlehem, and Edwin H. Strain, Allentown, both of Pa., assignors to Raytheon Company, Lexington, Mass.

Filed Sept. 4, 1973, Ser. No. 394,204
Int. Cl. F23n *5/14*
U.S. Cl. 431—66 **6 Claims**



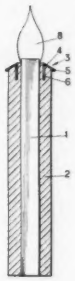
1. An electric ignition system for a fluid-fueled burner comprising an electrically operable valve for controlling flow of fuel to the burner, an electrical resistance type ignition wire for igniting fuel at the burner when at least a predetermined minimum amount of electric current is passing through it, and a current-activated relay connected directly to said wire and said valve, said relay being sensitive to current passing to it from said ignition wire and being operable to energize said valve only when at least said predetermined minimum amount of current is passing through said ignition wire.

3,871,815

CANDLE FOR PRODUCING A COLORED FLAME

Jean Cangardel, Saint Front sur Lemance, 47500 Fumel, France

Filed Feb. 11, 1974, Ser. No. 441,349
Claims priority, application France, Mar. 8, 1973, 73.08409
Int. Cl. C11c *5/00*
U.S. Cl. 431—126 **13 Claims**



1. A candle for producing a colored flame comprising:

a. a central rod made of at least 70 percent metaldehyde;

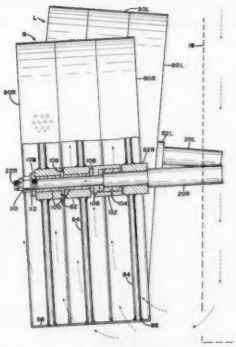
b. a body surrounding said rod and made of a composition including stearic acid.

3,871,816

DRIVE MECHANISM FOR PASSING CONTINUOUS STRIP THROUGH AN OVEN

Grant F. Strong, Wabash, Ind., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Aug. 3, 1973, Ser. No. 385,620
Int. Cl. F27b *9/28*
U.S. Cl. 432—59 **10 Claims**



1. In an oven for heating an elongated strip of material, the oven including an inlet side, an outlet side, a front, and drive mechanism to pass the strip through the oven, said drive mechanism comprising:

a. first and second drive shafts, each having a drive end and a wheel end, said shafts defining a pair of substantially parallel vertical planes, said first drive shaft adjacent the inlet side of the oven and said second drive shaft adjacent the outlet side of the oven;

b. a first free shaft, rotatably located axially with said first

drive shaft and a second free shaft, rotatably located axially with said second drive shaft, each of said free shafts having a drive end and a wheel end;

c. a number of generally cylindrical substantially hollow wheels including:

i. a first driven wheel fixedly mounted on said wheel end of said first drive shaft, a second drive wheel fixedly mounted on said wheel end of said second drive shaft; and

ii. at least one free wheel rotatably mounted on said wheel end of each of said free shafts, each of said free wheels being adapted to rotate at slower rotational speeds than said free shafts;

d. drive means operatively associated with said drive shafts and said free shafts to provide rotational movement of each of said shafts, each of said shafts being adapted to rotate at a different speed than the remainder of said shafts.

3,871,817
SIMULTANEOUS DYEING AND CROSSLINKING OF CELLULOSIC FABRICS

Robert J. Harper, Jr., Metairie; Joseph S. Bruno, Chalmette; Eugene J. Blanchard, New Orleans, and Gloria A. Gautreaux, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 7, 1973, Ser. No. 395,097
Int. Cl. D06p *5/04*
U.S. Cl. 8—17 **5 Claims**

1. A process for simultaneously imparting to cellulosic fabrics durable-press performance and the dyeing of cellulosic fabrics with more than one color of which one color is due to basic dye, said process comprising:

a. coating one side of cellulosic fabric with a formulation containing about 9.0 weight percent of dimethylol dihydroxyethyleneurea, from about 0.5 to 4.0 weight percent of an acid type catalyst selected from the group consisting of:

zinc nitrate hexahydrate, magnesium chloride hexahydrate, citric acid, tartaric acid, glycolic acid, mandelic acid,

and a mixture of magnesium chloride hexahydrate with either citric, tartaric, glycolic or mandelic acid in 1:1 or 1:3 ratios, from about 0.2 to 3.0 weight percent of a basic dye, from 0.6 to 1.0 weight percent of hydroxyethylcellulose, and the remainder water,

b. drying the coated fabric from (a) at a temperature from 30° to 90° C for a period of 2 to 30 minutes,

c. curing the fabric from (b) at a temperature of 120° to 160° C for a period from about 5 to 15 minutes,

d. laundering the fabric from (c), and

e. dyeing the fabric from (d) with a reactive cotton dye.

3,871,818
PROMOTING COLOR CHANGE IN HUMAN HAIR WITH A DIALDEHYDE COMPOUND AND A NITROGEN CONTAINING COMPOUND

James F. Kinney, Ramsey, N.J., and Antoni Edward Gadzala, Suffern, N.Y., assignors to Avon Products, Inc., Suffern, N.Y.

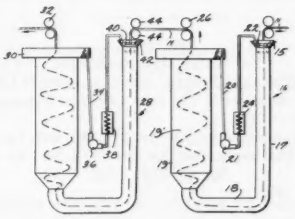
Continuation-in-part of Ser. No. 301,785, Oct. 30, 1972. This application Apr. 11, 1973, Ser. No. 350,170
Int. Cl. A61k *7/12*
U.S. Cl. 8—10.2 **9 Claims**

1. A method of promoting color change in human hair comprising applying to the hair an aqueous carrier containing dispersed therein from about 0.5 to about 5 parts per 100 parts of composition of a dialdehyde compound selected from the group consisting of ortho, meta, or para-phthalaldehyde and from about 0.1 part to 20 parts per 100 parts of composition of at least one nitrogen containing compound selected from the group consisting of monoalkanolamine, dialkanolamine, trialkanolamine, C_1–C_{15} alkyl alkanolamine, C_1–C_{15} dialkyl alkanolamine, C_1–C_{15} alkyl dialkanolamine and ammonium hydroxide, said alkanol radical of said nitrogen containing compound being a C_1–C_3 alkanol group; allowing the composition to remain on the hair for a period to effect the desired color change and rinsing said spent composition from the hair.

3,871,819
CONTINUOUS LIQUID TREATMENT OF TEXTILE MATERIALS

James E. Greer, P.O. Box B2, Greensboro, N.C.

Division of Ser. No. 716,256, March 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 292,389, July 2, 1963, abandoned. This application Oct. 31, 1969, Ser. No. 870,825
Int. Cl. D06m *3/42*
U.S. Cl. 8—130.1 **7 Claims**

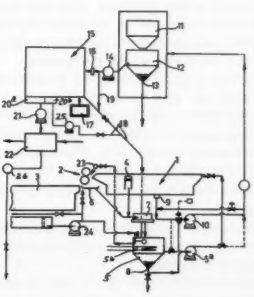


1. A process for decreasing the elongation, residual shrinkage and crocking of a dyed nylon textile containing nylon textile fibers comprising drawing the textile to stretch the fibers about 2 to 5 percent, contacting the textile with a dye and subsequently alternately contacting the textile with steam and liquid water maintained at temperatures between about 240°F. and 300°F. for 1 second to 20 minutes, cooling the said textile below 230°F. and releasing the drawing tension thereon, whereby the said nylon textile has an elongation of not in excess of 15 percent, a shrinkage no greater than about 4 percent and improved crocking.

3,871,820
WOOL SCOURING

Rex George Stewart, Christchurch; Gerald Vivian Barker, Lincoln, and John Leonard Hoare, Christchurch, all of New Zealand, assignors to Wool Research Organization of New Zealand (Inc.), Lincoln, Canterbury, New Zealand

Filed Aug. 17, 1973, Ser. No. 389,224
Claims priority, application New Zealand, Aug. 18, 1972, 168134
Int. Cl. D01c *3/00*
U.S. Cl. 8—139 **23 Claims**



1. Apparatus for use in wool scouring operations comprising a scouring tank for containing hot aqueous cleansing solution into which wool to be scoured is passed, means for moving the wool to liquor removing means associated with the scouring tank and whereby excess liquor is removed from the wool

leaving the scouring tank, a side tank for receiving overflow liquid and suspended solids from the scouring tank and liquid removed from wool leaving the scouring tank, means for recycling liquid from the side tank to the scouring tank, said scouring and side tanks having bottom outlets for heavy solids and from which the heavy solids can be passed to a heavy solids settling tank, said solids settling tank having an outlet for the discharge of solids and an outlet in communication with lanolin extraction or recovery plant whereby lanolin is recovered from liquid from the solids settling tank to leave liquid for recycling to the scouring tank and/or drainage.

3,871,821

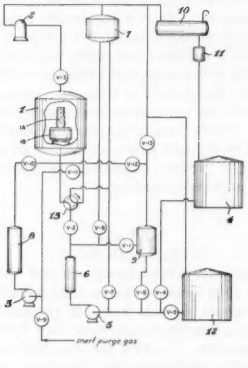
PACKAGE DYE PROCESS

William D. Winn, and James L. Dunn, Jr., both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 296,881, Oct. 12, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,299

Int. Cl. B05c *8/02*

U.S. Cl. 8—149.1 **1 Claim**



1. In a method for dyeing packaged yarn in a discontinuous process by stacking the packaged yarn onto spindles in a dye kier, filling the kier under pressure with dye liquor, heating said dye liquor while circulating the same through the kier, draining the spent dye liquor from the kier and drying the yarn packages, the improvement which comprises:

1. sealing the kier and subjecting the interior to a vacuum,
2. introducing into said evacuated kier vapors of an organic solvent which is to be employed as the solvent dye vehicle, continuing the introduction of vapors into said kier until the temperature of the kier and its contents are raised to the solvent boiling point, and the kier is filled with solvent vapors thereby expelling residual air from the kier and its contents,
3. filling the kier with a solvent dyebath which is heated and circulated through the kier until the desired dye fixation temperature is obtained,
4. removing the dyebath, now spent, and circulating vapors from the kier to a heater to raise the temperature of the kier and contents to above the boiling point of the dye vehicle, diverting a portion of the vapors from the kier to a condenser, thus removing from the cycle those vapors in excess of that necessary to fill the kier and the vapor heating system,
5. evacuating and purging the kier with an inert gas to remove residual traces of solvent vapors,
6. removing the dry dyed yarns, and
7. recovering solvent from the spent dyebath.

3,871,822

TREATMENT OF CELLULOSIC TEXTILE FABRICS WITH METHYLOLATED ALKOXYALKYL CARBAMATES

Henry G. Goodman, Jr., White Plains; Carol A. Dupraz, Flushing (Corona), and George H. Lourigan, New City, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 16, 1966, Ser. No. 527,772

Int. Cl. D06m *13/40*, *15/54*

U.S. Cl. 8—187 **4 Claims**

1. A process for treating cellulosic textile fabric comprising the step of applying to said textile fabric at elevated temperatures in the presence of an acid catalyst an effective amount of the product of the reaction of formaldehyde with an alkoxyalkyl carbamate of the general formula:

$$R\text{-}O\text{-}(R'\text{-}O)_n\text{-}C(=O)\text{-}NH_2$$

wherein R is an alkyl group of 1 to 8 carbon atoms, R′ is an alkylene radical of 2 carbon atoms, and *n* is an integer having a value of 1, said reaction being conducted at from about 20°C. to about the reflux temperature of the reaction mixture for a period of time from about 10 minutes to about 24 hours at an initial pH of from about four to about ten in a ratio of about 1.5 to about three moles of formaldehyde per mole of alkoxyalkyl carbamate.

3,871,823

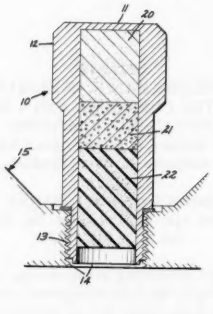
METHOD AND DEVICE FOR INHIBITING THE CORROSION OF METALLIC SURFACES

John D. Skildum, 34 North Oaks Rd., St. Paul, Minn. 55110

Filed June 3, 1971, Ser. No. 149,665

Int. Cl. C23f *11/02*; **F02b** *77/04*

U.S. Cl. 21—2.5 B **4 Claims**



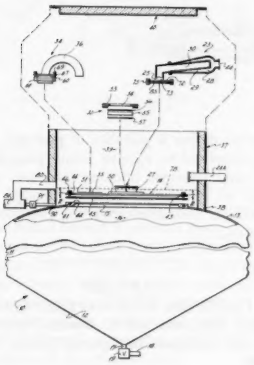
1. A method of inhibiting the corrosion of the internal metallic surfaces of an apparatus comprising the steps of:

a. providing a housing defining a cavity therein;
b. placing a mixture of organic ammonium nitrites with varying vapor pressures within said cavity;
c. placing within said cavity a chemical buffer system for neutralizing lead acids;
d. placing said housing within the apparatus to be protected; and,
e. whereby said internal surfaces are exposed to and contacted by the organic nitrites and chemical buffer system within said cavity.

3,871,824
METHOD OF ASEPTICALLY CONNECTING A FITTING TO AN ASEPTIC STORAGE TANK

Steve A. Rechtsteiner; Philip E. Nelson, both of Cincinnati, Ohio, and John R. Heron, West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed June 19, 1974, Ser. No. 480,842
Int. Cl. A61l *1/00*
U.S. Cl. 21—58 9 Claims



1. A method of aseptically connecting a fitting to an opening in a bulk storage tank, which opening is surrounded by a liquid-retaining enclosure, whereby the fitting communicates with the tank interior, comprising the steps of:

filling the tank with liquid chemical sterilant to sterilize the tank interior,

filling the liquid-retaining enclosure which surrounds the tank opening, while the tank interior is in a sterile condition, with a liquid chemical sterilant to provide a liquid sterilant bath in contact with the tank opening, and

immersing the fitting in the sterilant bath to sterilize the fitting and while immersed and in a sterile condition connecting the fitting to the tank opening to thereby isolate the sterile tank interior from the environment via the sterile fitting.

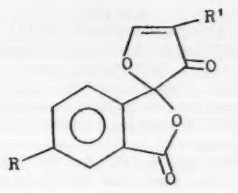
3,871,825
FLUOROMETRIC REAGENTS AND METHODS

Willy Leimgburger, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann La-Roche Inc., Nutley, N.J.

Division of Ser. No. 212,790, Dec. 27, 1971, Pat. No. 3,812,181. This application Mar. 4, 1974, Ser. No. 447,610
Int. Cl. G01n *31/22*; G01n *33/16*
U.S. Cl. 23—230 M 23 Claims

1. A method for determining a primary amine-containing compound in a mixture containing same which method comprises:

treating said mixture with a compound of formula I



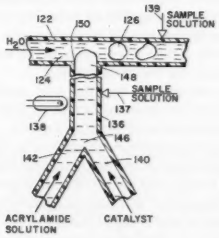
wherein R is hydrogen, halogen, lower alkyl or lower alkoxy and R′ is lower alkyl or aryl

to produce a fluorescent substance therein and fluorescing said substance.

3,871,826
METHOD AND APPARATUS FOR TRANSPORTING DISCRETELY SAMPLES TO BE ANALYZED IN A GEL

Bohdan Bakay, 2967 Curie St., San Diego, Calif. 92122

Continuation-in-part of Ser. No. 211,182, Dec. 23, 1971, abandoned. This application Dec. 29, 1972, Ser. No. 319,525
Int. Cl. B08b *9/00*; G01n *31/08, 33/00*
U.S. Cl. 23—230 R 17 Claims



1. In the method for transporting samples to an analyzer the improvement comprising the steps of:

forming a stream by introducing a liquid carrier into a conduit and by introducing gel spacers into said conduit, introducing fluid samples into the stream at spaced intervals,

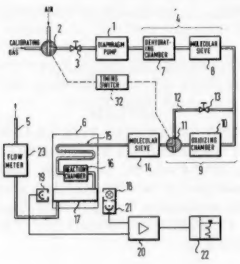
and wiping films of the liquid carrier and sample from the inner wall surfaces of said conduit with said gel spacers.

2. In a method for transporting samples of material through a conduit of an automatic transfer apparatus as a flowing stream of such samples separated by spacers, the improvement wherein the spacer consists essentially of a gel which is characterized by cohesive forces which cause the gel to retain its physical form and shape and having a size to be squeezed into the conduit which carries the sample stream thereby to wipe the inner surface of the conduit to prevent smearing of said material along the conduit, to reduce conical flow and cause discrete zonal flow of the samples which are spaced by the gel spacer.

3,871,827
APPARATUS FOR DETERMINING SMALL AMOUNTS OF CARBON MONOXIDE OR HYDROGEN IN ATMOSPHERIC AIR

Wolfgang Seiler, Mainz-Gonsenheim, and Ulrich Schmidt, Mainz-Finthen, both of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, Germany

Filed Apr. 25, 1973, Ser. No. 354,307
Claims priority, application Germany, May 18, 1972, 2224408
Int. Cl. G01n *21/26, 31/00*
U.S. Cl. 23—254 R **13 Claims**



1. Apparatus for determining the concentration in a gas mixture of one gaseous component capable of reducing mercuric oxide to metallic mecury, said apparatus comprising:

a. purifying means permeable to said component while substantially impervious to at least one other component of said mixture capable of reducing said mercuric oxide;

b. measuring means for measuring the remainder of mercuric oxide reducing components in the purified mixture, said measuring means including:

1. heating means for heating said purified mixture to a reaction temperature sufficient to permit reaction of said one component with mercuric oxide,

2. a reaction chamber maintained by said heating means at said temperature and charged with yellow mercuric oxide for contact with the heated purified mixture, and

3. a measuring cell maintained by said heating means at least at said temperature;

c. conveying means for passing a stream of said mixture sequentially through said purifying means, said heating means, said reaction chamber, and said measuring cell; and

d. optical sensing means responsive to the presence of elementary mercury in said cell for producing indicia indicative of the concentration of mercury in said cell.

3,871,828
HYDRAZINE GAS GENERATOR

M. Edmund Ellion, Arcadia, and Dwight A. Mahaffy, Englewood, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 10, 1972, Ser. No. 296,392
Int. Cl. B01j *0/04;* **F02k** *9/02*
U.S. Cl. 23—281 **10 Claims**

1. A hydrazine gas generator comprising:

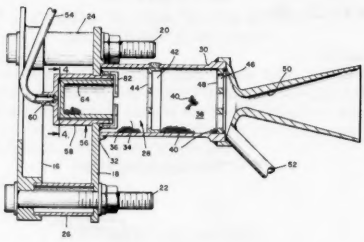
a decomposition chamber for containing a decomposition catalyst;

a liquid distributor for distributing liquid which is exothermically decomposable in the presence of the decomposition catalyst;

an outlet from said decomposition chamber to permit the discharge of hot gaseous products of decomposition for utilization, said liquid distributor comprising:

an orifice for controlling hydrazine liquid flow to said decomposition chamber;

an injector housing having an internal surface a distributor body having an external surface positioned within said injector housing, said surfaces being in contact with each other, a plurality of grooves formed in at least one of said

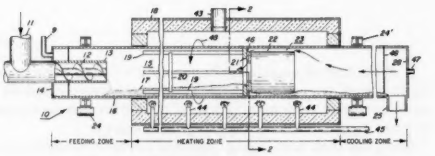


surfaces to define a plurality of passages, said passages being connected to receive liquid passed through said orifice, said passages opening into said decomposition chamber so that liquid passing through said orifice is delivered into said decomposition chamber in a plurality of locations.

3,871,829
CALCINER WITH BAFFLE MEANS

W. Gill Keith, San Jose, and F. Donald Ferris, San Martin, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Oct. 20, 1972, Ser. No. 299,356
Int. Cl. B01j *6/00*
U.S. Cl. 23—279 **13 Claims**



1. A rotary calciner comprising

a. a housing defining a chamber having a feeding zone, a heating zone and a cooling zone,

b. heating means for heating the heating zone,

c. feeding means for introducing a composition into the chamber,

d. outlet means for removing the treated composition from the chamber,

e. means for circulating the composition and moving the composition from the feeding means to the outlet means of the chamber,

f. gas inlet means for introducing an atmosphere into the chamber positioned so that the atmosphere moves countercurrently to the movement of the composition through the calciner,

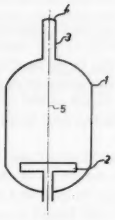
g. gas outlet means for removal of the atmosphere from the chamber, and

h. a baffle means having at least one face positioned in the housing of the calciner so that the baffle means restricts the passage of the controlled atmosphere to a zone of greater flow velocity around the periphery of the baffle means and the gaseous impurities removed from the composition in the heating zone are substantially prevented from diffusing to the cooling zone of the calciner.

3,871,830
POLYMERIZATION REACTOR HAVING A CLOSED UPPER CHAMBER PORTION OF REDUCED DIAMETER AND POLYMERIZATION PROCESS THEREIN

Jean-Marie Chauvier, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed July 12, 1973, Ser. No. 378,403
Claims priority, application France, July 13, 1972, 72.25672
Int. Cl. B01j *3/00;* **C08f** *3/30*
U.S. Cl. 23—285 **3 Claims**



1. An improved reactor for carrying out polymerization in an aqueous medium, comprising, in combination:

a cylindrical vessel having a vertical axis;

a stirrer system in the lower portion of said vessel;

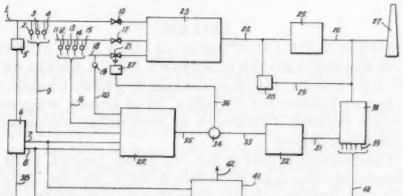
a closed upper chamber portion at the upper portion of said vessel and coaxial with the vessel, said upper chamber portion having an inside diameter whose ratio to the inside diameter of the cylindrical vessel is between **0.20** and about **0.33** and a volume exceeding **2.5%** of the actual volume of the reactor; and

a bursting disc on said upper chamber portion.

3,871,831
PROCESS FOR AUTOMATED REGULATION OF SULPHUR PRODUCTION UNITS

Guillaume Andral, Pau; Michel Carmassi, Mazeres-Lezons; Bernard Louvel, Buros; Jacques Maurice, Mourenx, and Georges Vandesande, Aroagnon, all of France, assignors to Societe Anonyme dite: Aquitaine Total Organico, Paris, France

Division of Ser. No. 207,790, Dec. 14, 1971, abandoned. This application Aug. 24, 1973, Ser. No. 391,478
Int. Cl. G01n *7/00;* **C01b** *17/16*
U.S. Cl. 23—255 R **10 Claims**



1. A device for the automatic regulation of a sulphur unit that produces sulphur by the oxidation of a hydrogen sulphide-containing gas by means of a free oxygen-containing gas, said gases being fed to the inlet of the sulphur unit through suitable inlet pipes and said sulphur unit liberating residual gases containing H_2S and SO_2 through a residual gas pipe, said device comprising:

a first analyzer for automatically analyzing the H_2S-containing gas fed to the inlet of the sulphur unit for providing a signal representative of the H_2S content of said gas,

a first calculator connected to receive the signal provided by said first analyzer for computing the theoretical flow of free oxygen-containing gas to be fed to the inlet of the sulphur unit to keep the H_2S : SO_2 molar ratio in the residual gases to a set value and for providing an output signal representative of said theoretical flow,

sampling means for continuously taking samples of the residual gases,

a second analyzer for automatically analyzing said samples for providing signals representative of the H_2S and SO_2 contents of the residual gases,

a second calculator connected to receive the signals from the second analyzer for computing the instantaneous H_2S : SO_2 molar ratio in the residual gases and for computing a correction value representing the correction needed in the flow of free oxygen-containing gases to the inlet of the sulfur unit to adjust said instantaneous ratio to the set value, said second calculator providing a signal representative of said correction value,

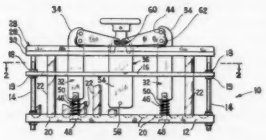
means for electronically combining the signals provided by said first and second calculators to produce a resulting signal representing their sum, and

means responsive to said resulting signal for automatically controlling the flow of free oxygen-containing gas to the inlet of the sulphur unit.

3,871,832
TEST TUBE RACK

Alcide Leblanc, Montreal, Quebec, Canada, assignor to Institut de Bio-Endrocrinologie, Inc., Montreal, Canada

Filed Mar. 5, 1974, Ser. No. 448,360
Int. Cl. G01n *1/10;* **B01l** *3/14*
U.S. Cl. 23—259 **12 Claims**



1. A locking mechanism for locking a removable cover over a plurality of open ended tubes of a test tube rack, the cover including a resilient liner on the lower face thereof, comprising, in combination: vertical securing means having one end mounted to a bottom wall of said rack and having at the opposite end thereof a portion protruding said cover; actuator means having an upper portion disposed above said cover and a lower portion slidably mounted through said cover; lever means pivotally attached to one end thereof to the upper portion of said actuator means, the other end thereof defining engagement means for engaging said protruding portion of said securing means; pivot means on said lever means in contacting engagement with the upper face of said cover, and being slidable thereon whereby, upon downward movement of said actuator means, said lever means are moved to said protruding portion of said securing means and said engagement means tightly secure said protruding portion to provide a sealing engagement between the liner and the tubes, the resiliency in said liner allowing for height differential between the ends of the tubes.

3,871,833

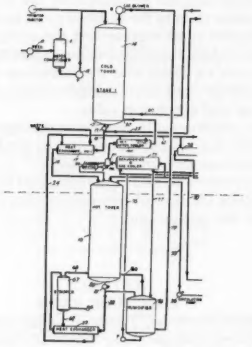
MEANS FOR IMPROVING THERMAL CONTROL IN DUAL TEMPERATURE SYSTEMS

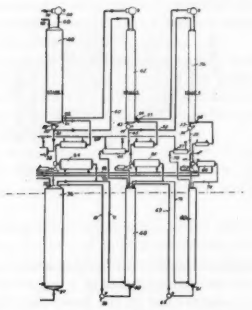
Jerome S. Spevack, 160 Pinebrook Dr., New Rochelle, N.Y. 10801

Continuation of Ser. No. 43,626, April 30, 1970, abandoned, which is a division of Ser. No. 587,365, Sept. 26, 1966, which is a continuation of Ser. No. 822,973, June 25, 1959, abandoned, which is a division of Ser. No. 188,925, Sept. 29, 1950, Pat. No. 2,895,803. This application Feb. 7, 1973, Ser. No. 330,327

Int. Cl. B01j *1/00*

U.S. Cl. 23—260 **10 Claims**





1. A cooperating assembly for increasing thermal efficiency in a gas and liquid processing apparatus of the type which comprises:

a. a first means for heating from a first temperature to a second temperature a flow of gas, to be subsequently processed at a third temperature higher than said second temperature in contact with a vaporizable liquid, said first means having an inlet thereto and an outlet therefrom for said flow.

b. a second means, for further heating to and processing said flow of gas at said third temperature in contact with the vaporizable liquid, said second means having a vaporizable liquid supply thereto, a gas inlet end with a gas inlet thereto and a gas outlet end with a gas outlet therefrom and having its gas inlet connected to the outlet from said first means to receive said flow therefrom,

c. a third means, for cooling said processed flow and condensing vapors of said liquid therefrom, said third means having an inlet thereto connected to the gas outlet of said second means for receiving the processed flow therefrom and having gas and liquid outlet means for discharging flows of the cooled gas and liquid condensate therefrom, and

d. heat transfer means interconnecting said first and third means and comprising an indirect contact heat exchanger for transferring heat from said third means to said first means,

in which assembly

e. said first means further comprises liquid inlet means for providing a quantity of the vaporizable liquid in contact with the flow of gas being heated therein, for effecting in said first means vaporization of said liquid and saturation of said gas with vapor of the liquid in contact therewith by heat transferred to said first means by said heat transfer means,

whereby the flow in said first means is enabled to recover from the flow in said third means all of the heat required for both heating said flow of gas in said first means and saturating the same with vapors of said liquid at said second temperature, thus correspondingly reducing the amount of further heating which would otherwise be required to attain said higher temperature in said second means.

3,871,834

CARBON-FIBER-REINFORCED ALUMINUM COMPOSITE MATERIAL

Keiichi Kuniya, and Hideo Arakawa, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 23, 1971, Ser. No. 211,177

Claims priority, application Japan, Dec. 25, 1970, 45-117612

Int. Cl. B32b *15/14*

U.S. Cl. 29—183 **23 Claims**

1. A carbon fiber-reinforced aluminum composite material comprising an aluminum containing matrix with at least one alloying element which is reactive with carbon and carbon fibers embedded in said matrix that have a tensile strength larger than that of said matrix, the amount of said carbon fibers being larger than the critical volume ratio required to reinforce said matrix and the surfaces of said carbon fibers being substantially covered with a thin carbide film formed by reaction of said element with carbon, said carbide film being in direct contact with said matrix so that said carbon fibers intimately adhere to said matrix.

3,871,835

REFRACTORY COMPOSITE ALLOYS CONTAINING ROD-LIKE AND/OR PLATELET-LIKE LAMELLAE

Herve E. Bibring, Meudon; Georges P. Seibel, Cachan, and Maurice Rabinovitch, Chatillon, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Continuation-in-part of Ser. No. 2,160, Jan. 12, 1970, abandoned. This application July 3, 1972, Ser. No. 268,751

Claims priority, application France, Apr. 21, 1969, 69.12452; Dec. 23, 1969, 69.44708

Int. Cl. B32g *15/00;* **C22c** *19/00*

U.S. Cl. 29—191.2 **16 Claims**

1. A refractory directionally solidified polyvariant fiber-reinforced composite having eutectic-type structure consisting essentially of two distinct independent phases constituted by:

a. a complex multicomponent matrix phase consisting essentially of:

i. at least one metal selected from the group consisting of Fe, Ni and Co, and

ii. chromium in an amount between 10 and 25 percent by weight of the composite;

and in said matrix:

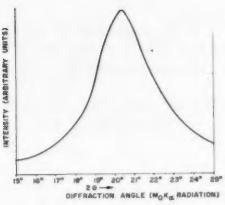
b. an in situ grown reinforcing phase free from chromium and consisting essentially of whisker-like elongated monocrystalline fibers of at least one metal monocarbide, the metal of which is selected from the group constituted by Ta, Nb, Hf and Ti.

3,871,836

CUTTING BLADES MADE OF OR COATED WITH AN AMORPHOUS METAL

Donald E. Polk, Morristown, and Robert C. Morris, Flanders, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 20, 1972, Ser. No. 317,039
Int. Cl. B26b *21/54*; B32b *15/00*
U.S. Cl. 29—194 **7 Claims**



1. A cutting implement comprising a metal which is at least 50% amorphous, characterized in that the metal has the composition M_aX_b, where M is at least one element selected from the group consisting of Ni, Fe, Co, Cr and V, X is at least one element selected from the group consisting of P, B, C, Si, Al, Sb, Sn, In, Ge and Be, *a* ranges from 65 atomic percent to 90 atomic percent and *b* ranges from 10 atomic percent to 35 atomic percent.

3,871,837

METHOD FOR LUBRICATING 2-STROKE ENGINES AND ROTARY ENGINES

Pierre Bedague, Meylan; Pierre Marchand; Guy Parc, both of Rueil-Malmaison, and Fernand Roux, Bougival, all of France, assignors to Institut Francais du Petrole, des Carburants et Carburants, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 319,871, Dec. 29, 1972, abandoned. This application June 1, 1973, Ser. No. 366,014
Claims priority, application France, June 2, 1972, 72.20040
Int. Cl. C10l *1/22*
U.S. Cl. 44—58 **13 Claims**

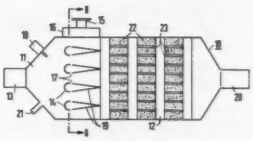
1. A method for lubricating a two-stroke engine fed with gasoline, comprising introducing into the engine a lubricating composition having a viscosity at 98.9°C of at least 6 centistokes, the base lubricant of which contains from 10 to 100% by weight of at least one polyalkyleneglycol derivative being bis octadecanoate or bis dodecanoate of a C_2–C_5 polyoxyalkylene glycol containing 2–50 oxyalkylene units.

3,871,838

APPARATUS FOR REACTING VAPORIZED, GASIFIED OR ATOMIZED HYDROCARBON WITH A GAS SERVING AS AN OXYGEN CARRIER

Hans-Joachim Henkel; Eugen Szabo De Bucs, both of Erlangen, and Christian Koch, Nurnberg-Grossgrundlach, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 21, 1973, Ser. No. 372,311
Claims priority, application Germany, July 3, 1972, 2223656
Int. Cl. C10g *9/04*
U.S. Cl. 48—107 **10 Claims**



1. In apparatus for the catalytic reaction of a mixture of evaporated liquid fuel and an oxygen carrying gas to form reformed gas, comprising:

a. a mixing chamber which is free of catalytic material;

b. a reaction chamber adjacent to the mixing chamber and connected therewith, which contains catalytic material;

c. means for feeding the evaporated liquid fuel to said mixing chamber in such a manner that a flow through the mixing chamber and the reaction chamber is established; and

d. means within the mixing chamber to mix the oxygen carrying gas with said evaporated liquid fuel, wherein the improvement comprises improved mixing means comprising:

1. at least one tube with a multiplicity of discharge openings for the oxygen carrying gas, which openings are distributed over the flow cross section of the mixing chamber in such a manner that the oxygen carrying gas leaves said tube perpendicular to the flow direction of the evaporated liquid fuel flow through the mixing chamber;

2. gas guide surfaces arranged adjacent to the discharge openings at the tube, said surfaces extending in the flow direction of the evaporated liquid fuel flow up to the vicinity of the reaction chamber, said surfaces gradually increasing the clear flow cross section narrowed down by said tube; and

3. means for supplying the oxygen carrying gas to said tube.

3,871,839

METHOD OF FEEDING SOLID CARBONACEOUS MATERIAL TO A HIGH TEMPERATURE REACTION ZONE

Burton E. Moody, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

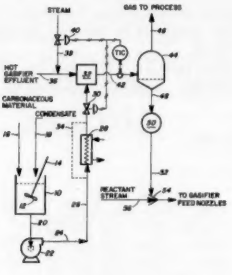
Filed Oct. 12, 1972, Ser. No. 296,959
Int. Cl. C10j *3/06*
U.S. Cl. 48—197 R **7 Claims**

1. A method of feeding carbonaceous particles to a gasifier operating at elevated temperature and pressure comprising the steps of:

forming a slurry of solid carbonaceous particles with water as a liquid vehicle;

pumping the slurry into a drying chamber, said drying chamber being separated from said gasifier, maintained at approximately the operating pressure of the gasifier wherein the slurry is mixed with hot effluent gases from

the gasifier so that the carbonaceous particles without substantial reaction are dried and heated and entrained in the effluent gas;



substantially immediately separating the entrained carbonaceous particles from the effluent gas which effluent gas includes evaporated water vehicle in the form of steam; and injecting the separated carbonaceous particles into the gasifier.

3,871,840

ABRASIVE PARTICLES ENCAPSULATED WITH A METAL ENVELOPE OF ALLOTRIOMORPHIC DENTRITES

Arthur G. Wilder, and Harold C. Bridwell, both of Salt Lake City, Utah, assignors to Christensen Diamond Products Company, Salt Lake City, Utah

Filed Jan. 24, 1972, Ser. No. 219,973

Int. Cl. B24d *3/06, 3/34*

U.S. Cl. 51—295 **25 Claims**

1. An article of manufacture consisting of abrasive particles having a hardness of above about 2000 kg/mm² encapsulated with a metal envelope formed of allotriomorphic dendrites.

3,871,841

PROCESS OF RADIOACTIVE WASE GASES

Horst Queiser, Hochstadt; Horst Schwarz, Wiesbaden, and Hans-Jurgen Schroter, Essen, all of Germany, assignors to Licentia-Patent-Verwaltungs-G.m.b.H., Frankfurt am Main and Bergwerksverband GmbH, Essen-Kray, both of, Germany

Filed Apr. 2, 1973, Ser. No. 346,890

Claims priority, application Germany, Apr. 1, 1972, 2216104

Int. Cl. B01d *53/04*

U.S. Cl. 55—66 **9 Claims**

1. Method for processing waste gases containing radioactive activation gases including radioactive isotopes of nitrogen and oxygen, which comprises passing said waste gases containing radioactive isotopes of nitrogen and oxygen through an adsorptive delay path wherein the adsorber volume is sufficient to adsorptively delay said radioactive isotopes of nitrogen and oxygen therein to permit substantial decay of said radioactive isotopes of nitrogen and oxygen, such substantial delay occuring without prior or subsequent mechanical delays of said radioactive isotopes of nitrogen and oxygen.

3,871,842

EXHAUST GAS CLEANING SYSTEM FOR HANDLING RADIOACTIVE FISSION AND ACTIVATION GASES

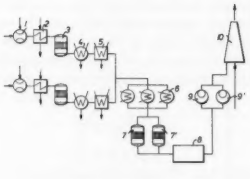
Horst Queiser, Hochstadt, and Horst Schwarz, Wiesbaden, both of Germany, assignors to Licentia-Patent-Verwaltungs G.m.b.H., Frankfurt, Germany

Filed July 5, 1972, Ser. No. 269,272

Claims priority, application Germany, July 5, 1971, 2133250; July 5, 1971, 7125651

Int. Cl. B01d *53/04*

U.S. Cl. 55—179 **9 Claims**



1. Apparatus for processing radioactive exhaust gases including fission gases and activation gases, said apparatus comprising preliminary adsorber means including a container, main adsorber means including a container, and adsorber material filling each of said adsorber containers, said main and preliminary adsorber means being connected to form a series delay path between a source of such exhaust gases and an exhaust gas chimney to constrain such exhaust gases to flow through said absorber material and to be delayed by said delay path in order to undergo radioactive decay, said delay path providing essentially the only gas delay between the source and the chimney, said preliminary adsorber means serving to permit radioactive decay of those exhaust gas components which constitute short-lived fission products and to filter out the resulting daughter products, said preliminary adsorber means being provided with shielding means and comprising means permitting easy replacement of said adsorber material.

3,871,843

LIQUID FUEL VAPORIZER

Ellis Leftwich, Rt. 2, Farmville, Va. 23901

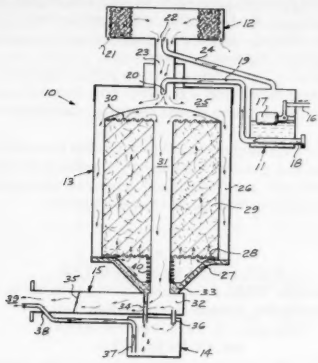
Filed Nov. 6, 1972, Ser. No. 304,141

Int. Cl. F02m *29/04*

U.S. Cl. 55—259 **10 Claims**

1. A liquid fuel vaporizer for converting a mixture of air and liquid fuel into a dry air-fuel mixture, said vaporizer comprising a central housing, means defining an inlet located at the bottom of said housing, means within said housing defining a first elongate vertical passageway within said housing which extends substantially the full height of said housing, a filter located in said passageway for vaporizing a mixture of air and liquid fuel drawn into said vaporizer inlet, a further elongate vertical passageway, concentric with said first passageway and

in communication with said first passageway at a location adjacent the top of said housing, which communicates at the



outlet end thereof with an outlet manifold, and an absorbent lining located in said vaporizer inlet.

3,871,844

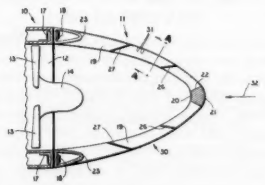
SCREEN APPARATUS FOR AIR INLET

Frank F. Calvin, Sr., 3792 Donaldson Dr., Chamblee, Ga. 30341

Filed Sept. 28, 1973, Ser. No. 401,898

Int. Cl. B01d *39/12*

U.S. Cl. 55—306 **6 Claims**



1. Screen apparatus for attachment over the air inlet of a turbine engine, comprising:

screen means connected to the engine in fixed relation surrounding the engine air inlet and extending to a forward location extending outwardly and in front of the engine air inlet, said screen means having a generally smooth exterior surface presenting an oblique angle to the direction of relative movement between the engine air inlet opening and the surrounding air;

an imperforate arcuate frontal surface carried by said screen means at said forward location, said frontal surface having a blunt leading edge provided substantial resistance to oncoming air flow;

said screen means comprising a plurality of structural support members connected to said turbine engine in surrounding relation to the engine air inlet and extending outwardly to terminate at said forward location, with each of said support members being spaced apart from the adjacent support members to provide respective open spaces therebetween;

means connecting together said support members at least at one location spaced apart from said engine air inlet so that siad support members comprise a rigid skeletal support; and

said screen means including perforate means carried by said support members in surrounding relation thereto to comprise a perforate shell covering said open spaces and presenting said oblique angle, said perforate means having airflow perforations which are individually too small to admit engine damaging articles, the total aggregate area of all of said airflow perforations being at least as great as the airflow area of the engine air inlet.

3,871,845

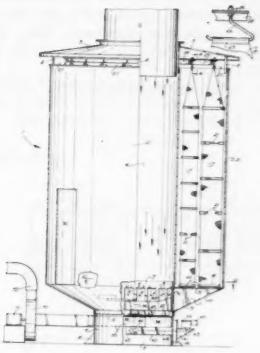
INDUSTRIAL AIR FILTER

Ralph H. Clarke; Wesley James Clarke, and Steven L. Mays, all of Eugene, Oreg., assignors to Clarke's Sheet Metal, Inc., Eugene, Oreg.

Filed June 25, 1973, Ser. No. 373,433

Int. Cl. B01d *46/02*

U.S. Cl. 55—284 **13 Claims**



5. An industrial air filter structure receiving a dust laden airflow from a primary air-particle separator, said filter structure comprising in combination,

an upright casing enclosing a plurality of filter bags, said casing normally open to the atmosphere,

a tubular inlet centrally disposed within the casing for reception of a downward flow of dust laden air,

a walled enclosure of circular configuration integral with the end of said inlet for reception of the dust laden air, said enclosure defining ports spaced circumferentially thereabout through which the dust laden airflow normally passes, a floor extending across and closing the lower end of the enclosure opposite the inlet end,

a bag mounting plate affixed to the upper peripheral edge of the walled enclosure,

filter bags mounted at their ends to the bag mounting plate and radially spaced from the tubular inlet, said bags receiving at their lower ends a flow of dust laden air for upward passage therealong,

a series of plenums circumferentially disposed about said walled enclosure each in communication with one of said ports and with at least one filter bag, each of said plenums defined by upright divider walls, an inclined bottom wall of the filter structure extending intermediate the outer periphery of the bag mounting plate and the walled enclosure, said bag mounting plate and said walled enclosure, and

a purge assembly within said walled enclosure and comprising a traveling purge duct in central communication with a continuous source of negative air pressure, an arcuate plate member carried by the duct outer end for moving surfacial contact with the walled enclosure, said plate member defining a purge opening sequentially communicating duct negative pressure to one of said plenums via one of said ports and to a filter bag associated therewith

to impart a reverse flow through the filter bag wall whereby dust particles deposited on the bag interior are dislodged from the bag for removal through said one of said plenums and the purge duct, said plate having port blocking surfaces adjacent said purge opening for blocking the entry of dust laden air during arcuate travel of the purge duct past said one port during filter bag purging.

3,871,846

DUST FILTER ARRANGEMENT

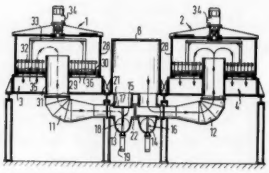
Max Berz, and Wolfgang Berz, both of Kochel am See, Germany, assignors to Wolfgang Berz, Kochel am See, Germany

Continuation of Ser. No. 208,269, Dec. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 143,130, May 13, 1971, abandoned, which is a continuation-in-part of Ser. No. 777,454, Nov. 20, 1968, Pat. No. 3,594,991, which is a continuation-in-part of Ser. No. 491,670, Sept. 30, 1965, abandoned. This application Apr. 1, 1974, Ser. No. 456,862

Claims priority, application Germany, Dec. 30, 1970, 2064611; Jan. 14, 1971, 2101606; Apr. 7, 1971, 2117088; Apr. 13, 1971, 2117834

Int. Cl. B01d *46/00*

U.S. Cl. 55—303 **5 Claims**



1. A filter arrangement for separating suspended solid particles from a raw gas comprising, in combination:

a. two groups of filter chambers arranged in respective rows;

b. a horizontally extending wall vertically separating a first compartment from a second compartment in each chamber,

1. said wall being permeable to gas flowing between said compartments while retaining solid particles suspended in said gas when the gas flows from said second compartment toward said first compartment through said wall,

2. said wall including a foraminous support member and a filter bed of granular material supported on said member;

c. a purified gas manifold permanently communicating with each of said first compartments;

d. a single branch conduit leading out of each of said second compartments;

e. a raw gas intake including a manifold portion interposed between said rows,

1. each branch conduit having an end portion remote from the associated second compartment and located below said manifold portion;

f. scavenging gas discharge means including two scavenging gas conduits located below said end portions;

g. valve means associated with each of said branch conduits for alternatively connecting the associated branch conduit with said raw gas intake and said scavenging gas discharge means,

1. said valve means being arranged in two rows, each valve means being operatively interposed between the end portion of the associated branch conduit, said manifold portion, and one of said scavenging conduits;

h. centrifugal separator means in said intake for removing suspended coarse particles from the raw gas before said raw gas is admitted to said filter chambers;

i. separating means connected to said scavenging gas discharge means for separating solid particles from scavenging gas flowing outward of said second compartments through said discharge means;

j. a circulating fan having a suction port connected to said separating means and a pressure port connected to said raw gas intake ahead of said centrifugal separator means; and

k. an exhaust fan connected to said purified gas manifold for drawing raw gas and scavenging gas separated from solid particles into said centrifugal separator means and for discharging purified gas from said manifold.

3,871,847

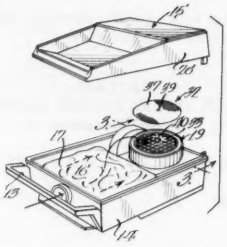
VACUUM CLEANER FILTER

Warren H. Fish, White Bear Lake, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 16, 1974, Ser. No. 433,916

Int. Cl. B01d *46/10*

U.S. Cl. 55—372 **10 Claims**



1. In a vacuum cleaner having a housing portion defining an air flow passage having an inlet, air flow means carried by said housing portion for drawing air through said inlet and including motor means disposed in heat transfer association with the drawn air, filter means for preventing foreign objects from passing through said inlet to said air flow means thereby to prevent damage to said air flow means by said foreign objects, said filter means comprising: a substantially rigid pervious support extending transversely across said inlet and formed integrally with said air flow passage means; a retainer element formed integrally with said air flow passage means and defining a retaining shoulder overlying said support; and a removable pliant filter pad overlying said support and being retained thereto substantially solely by a portion of the filter disposed between said retainer element and support and the air drawn through the filter pad by said air flow means.

3,871,848

AIR FILTER WITH BAGS

Wayne L. Smith, Bradford Woods, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

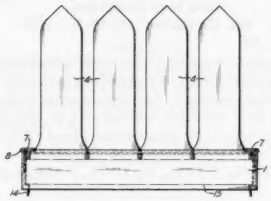
Filed Sept. 24, 1973, Ser. No. 399,836

Int. Cl. B01d *25/02*

U.S. Cl. 55—374 **6 Claims**

1. An air filter comprising a rectangular frame having a front and back, the back being provided with flange members projecting inwardly from the four sides of the frame, a row of filter bags disposed side by side behind the frame and having rectangular open front ends projecting forward into the frame, spaced parallel intermediate elongated channel members in the frame, each of said channel members receiving and clamping together adjoining side walls of the open ends of two of the bags, each channel member having opposite ends overlapping the front surfaces of said flange members at two opposite sides of the frame, a pair of end elongated channel members spaced from the intermediate channel members and receiving and

clamped onto the outer sides of the open ends of the two outermost bags in said row, said end channel members extending along the front surfaces of the flange members at the other two sides of the frame, and holding means engaging said end channel members to hold them in place with the areas of said outer sides of said outermost bags that are between the end

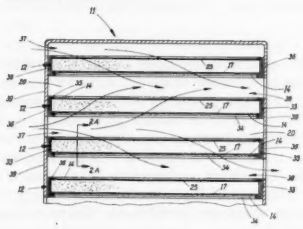


channel members and said last-mentioned flange members engaging said last-mentioned flange members, the portions of the bags that span the spaces between the channel members at the opposite ends of those members overlapping the front surfaces of said first-mentioned pair of flange members being pulled into sealing engagement with said first-mentioned flange members when the bags are inflated behind the frame.

3,871,849
DISPOSABLE CARBON FILTER

Tom R. Smith, and Richard D. Rivers, both of Louisville, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 5, 1973, Ser. No. 348,172
Int. Cl. B01d *27/08*
U.S. Cl. 55—484 **6 Claims**



1. A carbon filter comprising: at least one six-sided carton including a pair of opposed panels each having cutaway sections defining flow-through apertures therein;
sidewalls connecting said panels;
end portions forming closed ends on said carton;
a fluid pervious scrim material disposed within said carton across said flow-through apertures compressively containing activated granular carbon particles to form a filter bed resistant to the adverse effects of vibration and carbon particle attrition.

3,871,850
FILTER ELEMENT

Denis L. Lenane, Ferndale, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 20, 1973, Ser. No. 343,104
Int. Cl. B01d *46/46*
U.S. Cl. 55—486 **1 Claim**

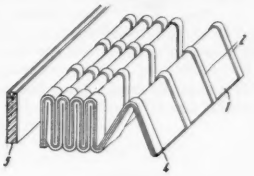
1. An exhaust system for an internal combustion engine including an exhaust gas filter, said filter comprising a filter housing having an inlet and an outlet, said inlet being operatively connected to receive the exhaust gas from said internal combustion engine, said filter housing containing a filter element disposed across said housing such that substantially all of the exhaust gas passes through said filter element in passing

from said inlet to said outlet, said filter element comprising a wire mesh having non-woven poly(m-phenyleneisophthalamide) mats on both surfaces of said wire mesh sewn to each other through said wire mesh.

3,871,851
FILTER PACK

Gerhard Max Neumann, Berlin, Germany, assignor to Delbag Luftfiler GmbH, Berlin, Germany

Filed July 27, 1972, Ser. No. 275,700
Int. Cl. B01d *27/06*
U.S. Cl. 55—521 **13 Claims**



1. A filter pack comprising:
an elongated sheet of filter paper folded in a zigzag shape along transversely extending folds to present a continuous filter structure having a series of lengths interconnected by a corresponding series of generally U-shaped bight sections,
said lengths being disposed in space, generally parallel relationship to present, along with said bight sections, a series of outwardly opening spaces between the lengths with alternate spaces opening outwardly of the structure from opposite sides thereof; and
a plurality of elements constructed of a hardened, initially adhesive material interconnecting the lengths of the paper and rigidifying the shape of the structure,
each of said elements extending longitudinally of the folded sheet of paper and each including a series of generally parallel, spaced, rigid, projecting portions, each portion being shaped to substantially completely fill the cross-sectional area of one of the spaces,
there being a first sequence of said elements disposed in laterally spaced relationship on one side of the structure, each element of said first sequence thereof having a respective portion projecting into each of the spaces which open outwardly of said one side of the structure,
there being a second sequence of said elements disposed in laterally spaced relationship on the other side of the structure, each element of said second sequence thereof having a respective portion projecting into each of the spaces which open outwardly of said other side of the structure,
each of said portions being rigidly connected to each of the lengths of filter paper which define the corresonding space in which that portion is disposed whereby said lengths are interconnected and the shape of the structure is rigidified.

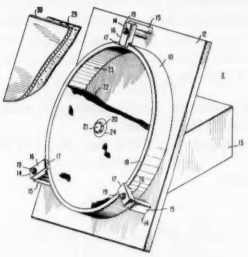
3,871,852
METHOD OF MAKING GLASS-CERAMIC MATRIX USING CLOSED TUBES

Yu K. Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 146,665, May 25, 1971, , which is a continuation-in-part of Ser. No. 30,859, April 22, 1970, abandoned. This application May 5, 1972, Ser. No. 250,550

Int. Cl. C03c *23/20, 29/00*

U.S. Cl. 65—4 19 Claims



1. A method for making a glass-ceramic matrix comprising an assembly of integrally fused tubes forming a series of smooth, longitudinal parallel passageways therethrough, wherein the walls defining said passageways have essentially zero proosity and an average coefficient of lineal thermal expansion of about −12 to +12 × 10^{-7}/°C. over the range 0°–300°C., which comprises

1. tightly packing together a multiplicity of elongated tubes made of a glass that is thermally crystallizable to a low expansion glass-ceramic having a coefficient of lineal thermal expansion of about −12 to +12 × 10_{x}^{7}/°C. over the range before stated, each of the tubes being sealed at each end and containing an expansible, fluid medium, each of said tubes being essentially parallel to the other tubes in the pack,
2. said tubes having a maximum inner diameter of 0.1 inch, a wall thickness of about 0.015 inch to about 0.001 inch and an inner diameter to wall thickness ratio of at least 6,
3. constraining the outer periphery of said tightly packed tubes against outward movement in a direction perpendicular to said longitudinal passageways,
4. subjecting said constrained tightly packed tubes to a temperature sufficient to soften said tubes and thus to cause said fluid medium entrapped therein to urge the said tubes into tight contact with adjacent tubes, thereby to aid in the fusion of such tubes, said temperature being in the temperature range of 50° to 250° F. above the annealing point of said glass, in which temperature range said glass nucleates during said expansion and fusion, and
5. thereafter further heating said tubes to a higher temperature than the temperature in step 4 in the range from 200° to 500° F. above the annealing point of the original glass, and
6. finally heating said fused matrix in a temperature range of from 1800° to 2300° F. and thereby completing crystallization thereof to a glass-ceramic having an expansion in the range aforementioned.

3,871,853
METHOD OF MELTING GLASS IN A PLATINUM CONTAINER IN A CONTROLLED ATMOSPHERE

Earl D. Dietz, and Paul R. Wengert, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. Nos. 177,095, Sept. 1, 1971, abandoned, and Ser. No. 177,090, Sept. 1, 1971, Pat. No. 3,837,828. This application July 9, 1973, Ser. No. 377,883The portion of the term of this patent subsequent to Sept. 24, 1991, has been disclaimed.

Int. Cl. C03b *5/16;* C03c *15/00*

U.S. Cl. 65—32 13 Claims

1. In a method of melting glass compositions in a container containing at least 50% by weight of platinum with a minimum of attack on the container, the improvement comprising melting the glas in a reducing atmosphere in which the partial pressure of oxygen is no greater than about 10^{-3} atmospheres with a buffered gas mixture of the group consisting of CO_2/NH_3, CO_2/H_2, H_2O/H_2, H_2O/NH_3, H_2O/CO and CO_2/CO

3,871,854
MANUFACTURE OF FLAT GLASS RIBBONS ON A MOLTEN METAL BATH

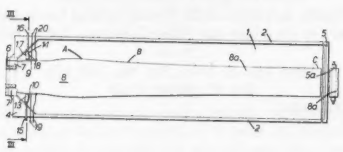
Harold Barry Milnes, Billinge, near Wigan, England, assignor to Pilkington Brothers Limited, Lancashire, England

Filed Oct. 24, 1973, Ser. No. 411,017

Claims priority, application United Kingdom, Oct. 31, 1972, 50170/72

Int. Cl. C03b *18/02*

U.S. Cl. 65—65 A 10 Claims



1. A method of manufacturing flat glass in ribbon form of a desired thickness in the range 5.5 mm to 8 mm on a molten metal bath, comprising pouring molten glass onto the bath to forwardly feed a layer of molten glass advancing along the bath, imposing initial acceleration on the layer of molten glass by laterally confining the edges of that layer of molten glass adjacent the location of said pouring as the glass is advanced under the influence of tractive effort discharging the ribbon from the bath at a speed in the range 380 to 600 metres per hour thereby forming a laterally confined and accelerating body of molten glass of thickness greater than the desired thickness, and then, while the glass is at a viscosity which permits deformation and lateral movement and the glass is advancing at a speed in excess of about 250 metres per hour engendered by said tractive effort and said initial acceleration of the layer of molten glass enhanced by lateral confinement thereof, permitting unconstrained lateral movement of the edges of the advancing ribbon as the glass is attenuated to the desired thickness in said range by further acceleration to the high speed of discharge of the ribbon from the bath.

6. Apparatus for manufacturing flat glass in ribbon form of thickness in the range 5.5 mm to 3 mm, comprising an elongated tank structure containing a bath of molten metal, means for delivering molten glass to one end of the tank structure under a forwardlly directed pressure head at a controlled rate to forwardly feed a layer of molten glass advancing along the bath, fenders disposed at opposite sides of the tank structure at said one end thereof for laterally confining the edges of the layer of molten glass adjacent the location of said delivering and imposing initial acceleration on the layer of molten glass advanced under the influence of traction, the fenders having faces for engagement by the glass of a material not wetted by the glass and being splayed at an angle of the order of three

degress to the downstream direction of advance of the glass along the bath, the fenders further having an extent short of a zone where the glass is at a viscosity which permits deformation and lateral movement of the glass advancing at a speed in excess of about 250 metres per hour engendered by said traction and the initial acceleration of the layer of molten glass enhanced by confinement thereof, and traction means at the other end of the tank structure for applying traction to the glass and discharging a ribbon of glass of desired thickness from the bath.

3,871,855

APPARATUS FOR ROLL-PRESS FORMING HEAT-SOFTENED GLASS SHEETS

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 5, 1973, Ser. No. 376,751
Int. Cl. C03b *23/02*
U.S. Cl. 65—245 **9 Claims**

1. In apparatus for shaping glass sheets by the roll forming process comprising:

a set of upper shafts for supporting upper segmented shaping rolls,

a set of lower shafts for supporting lower segmented shaping rolls,

upper and lower segmented shaping rolls mounted in opposed pairs on said upper and lower shafts, respectively, each of said pairs of shaping rolls comprising a series of adjacent, axially aligned shaping roll segments, at least some of said adjacent segments having different diameters, and

at least one of the segments of each of said pairs of shaping rolls being fixed to its supporting shaft to rotate therewith, a predominate number of said segments of said shaping rolls being freely rotatable about their respective shafts,

the improvement comprising separator means affixed to said supporting shaft between at least some of said adjacent segments of different diameters, said separator means being spaced on said shaft so that only one of said adjacent segments of different diameters contacts said separator means at a time.

3,871,856

SELF-ALIGNING BAFFLE AND BLOWHEAD ASSEMBLY

Albert J. Trahan, Vernon, Conn., assignor to Emhart, Bloomfield, Conn.

Filed Oct. 11, 1973, Ser. No. 400,432
Int. Cl. C03b *9/00*
U.S. Cl. 65—261 **4 Claims**

1. In a glassware forming machine of the type having at least two side-by-side upwardly open molds, the upper surfaces of which may not be in the same horizontal plane, the improvement comprising:

a. a blowhead carrier movable toward away from the upper surfaces of said molds,

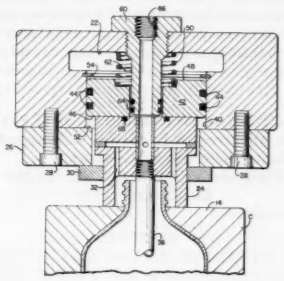
b. a blowhead retaining means mounted to the underside of said blowhead carrier,

c. a means for providing air under pressure, and said carrier defining an internal plenum chamber communicating therewith,

d. annular pistons slidably received in side-by-side bores defined in the lower wall of said carrier directly above each of said upwardly open molds,

e. adapters having depending stem portions, and portions fixed in an upper carrier wall, each of said pistons having a central opening for receiving one of said stem portions, each adapter having an opening extending therethrough, and an annular sealing means between each stem portion and piston opening,

f. blowheads for mating with each of said upwardly open molds, each blowhead having a depending blowpipe for



conveying blow air to the interior of each mold, each blowpipe having an upper end communicating with said adapter opening, and

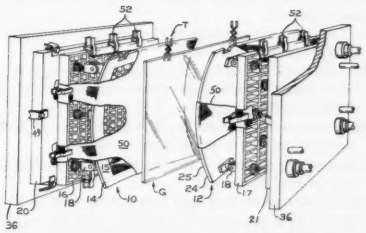
g. each piston having its lower surface held in engagement with one of said blowheads as a result of the air pressure in said plenum chamber, said piston and its associated blowhead being urged upwardly against the biasing force offered by said air pressure as said blowhead engages its associated mold.

3,871,857

APPARATUS FOR PRESS BENDING GLASS SHEETS

George R. Claassen, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 19, 1974, Ser. No. 443,288
Int. Cl. C03b *23/02*
U.S. Cl. 65—273 **6 Claims**



1. In apparatus for press bending a heat-softened glass sheet by pressurized engagement thereagainst comprising:

1. a metal plate deformable in the direction of its thickness and having a shaping surface whose shape approximates that of the shape desired for the glass sheet after bending and having sufficient rigidity to resist deformation during pressurized engagement against a heat-softened glass sheet,

2. a relatively rigid member more rigid than said metal plate located in spaced relation behind and in facing relation to said metal plate, and

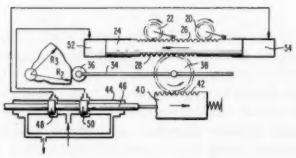
3. adjustable attachment means distributed in spaced relation throughout the area of said metal plate and said relatively rigid member by which the shape of said metal plate may be altered,

the improvement wherein said relatively rigid member comprises a metal grate with a plurality of elongated openings therein, said adjustable attachment means are attached to the rear surface of said metal plate and each have a portion that extends through a selected one of said elongated openings of said grate, said portions being of a dimension to permit lateral and longitudinal movement of said attachment means within said selected one of said openings, and means disposed on each side of said grate to engage therewith and with each said adjustable attaching means to adjust the position of said adjustable attaching means along said elongated openings and lengthwise relative to said grate to alter the shape of said metal plate.

3,871,858
GOB SELECTORS WITH CLOSED LOOP SERVO SYSTEM

John Martin, Monterrey, N.L., Mexico, assignor to Fabricacion de Maquinas, Monterrey, N.L., Mexico

Filed Nov. 13, 1973, Ser. No. 415,294
Int. Cl. C03b *5/30*
U.S. Cl. 65—304 **3 Claims**



1. Apparatus for simultaneously distributing a pair of mold charges being fed from a double orifice glass feeder to the double cavity blank molds of a plurality of glass forming machines comprising a pair of elongated, curved deflector scoops, means supporting said scoops in generally side by side relationship, each scoop being formed with an open, upwardly facing receiving end in co-axial alignment with one of the feeder orifices only and a lower end, a pair of rotatably mounted shafts one rigidly attached to each of said scoops repectively each of said shafts having a pinion gear rigidly attached thereto;

gear means engaged with said gears and movable to rotate said shafts in synchronism;

fluid pressure means for moving said gear means in opposite directions depending on the direction of application of fluid pressure;

valve means for controlling the admission of fluid under pressure to said fluid pressure means;

continuously rotatable cam means for controlling the position of said valve; and

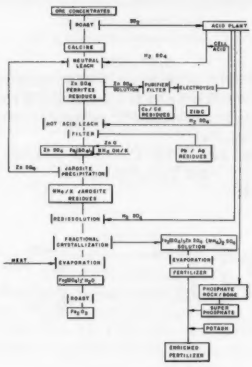
means interconnecting said cam means, said fluid pressure means said gear means and said valve in a closed loop servo system so that any movement of said gear means in response to movement of said valve means tends to return said valve means to its initial position.

3,871,859
PROCESS OF TREATING ELECTROLYTIC ZINC REFINING JAROSITE RESIDUES

David A. Jackson, 330 W. Diversey Pkw. No. 1407, Chicago, Ill. 60657

Continuation-in-part of Ser. No. 377,623, July 9, 1973, abandoned. This application Nov. 19, 1973, Ser. No. 416,845
Int. Cl. C05b *11/00*
U.S. Cl. 71—40 **8 Claims**

1. The method of producing a fertilizer material and valuable by-products from jarosite residue from the jarosite process of electrolytic refining of zinc which comprises acidifying the wet residue sufficiently to break down and redissolve the jarosite residue solids to produce a solution containing plant nutrients including the sulphates of iron, ammonium, zinc,



manganese and trace metals, and thereafter evaporating free water from the solution to crystallize out a substantial part of the iron sulphate, leaving the mother liquor containing the fertilizer material.

3,871,860
PRESERVATIVES FOR AQUEOUS SYSTEMS

Milton Manowitz, Fair Lawn, N.J.; Goerge R. Walter, Racine, Wis., and Stephen Foris, Jr., Belleville, N.J., assignors to Givaudan Corporation, Clifton, N.J.

Continuation-in-part of Ser. Nos. 573,845, Aug. 22, 1966, abandoned, and Ser. No. 786,453, Dec. 23, 1968, Pat. No. 3,629,465. This application Aug. 4, 1971, Ser. No. 169,043
Int. Cl. A01n *9/00;* **C02b** *3/06;* **D21f** *1/66*
U.S. Cl. 71—67 **3 Claims**

1. The process for combating spoilage by the action of slime-forming algae, bacteria and fungi microorganisms in industrial cooling water and water used in pulp and paper manufacturing, which comprises inhibiting said slime-forming organisms in such waters with an effective inhibiting amount of β-bromo-β-nitrostyrene, said amount being less than the minimal effective inhibiting concentration required for 2-bromo-2-nitroethylbenzene.

3,871,861
METHOD OF INHIBITING ALGAE UTILIZING TRIMETHYLBENZYLAMINOETHYLAMINE

John J. Merianos, Jersey City, and Phillip Adams, Murray Hill, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 130,783, April 2, 1971, Pat. No. 3,821,407. This application Dec. 3, 1973, Ser. No. 421,416The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.
Int. Cl. A01n *9/24*
U.S. Cl. 71—67 **1 Claim**

1. A method of inhibiting algae which comprises applying to said algae an effective amount sufficient to inhibit the growth of said algae of trimethylbenzylaminoethylamine.

3,871,862

AMINO DERIVATIVES OF TETRASUBSTITUTED BENZENE COMPOUNDS

John J. Merianos, Jersey City, and Phillip Adams, Murray Hill, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 291,824, Sept. 25, 1972, Pat. No. 3,838,197, which is a continuation-in-part of Ser. No. 130,783, April 2, 1971, Pat. No. 3,821,407. This application Dec. 5, 1973, Ser. No. 421,750The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.

Int. Cl. A01n 9/24

U.S. Cl. 71—67 2 Claims

1. A method of inhibiting algae which comprises applying to said algae an effective amount sufficient to inhibit the growth of said algae of the compound of N-trimethylbenzyl diethylene triamine.

3,871,863

PHYTOCIDAL COMPOSITIONS CONTAINING N-HETEROCYLIC ETHERS

Kenneth P. Dorschner, Jackson, and Carl Bordenca, Ponte Vedra, both of Fla., assignors to SCM Corporation, Cleveland, Ohio

Continuation of Ser. No. 8,094, Feb. 2, 1970, abandoned. This application May 31, 1972, Ser. No. 258,315

Int. Cl. A01n 9/00

U.S. Cl. 71—88 6 Claims

1. A process for controlling undesirable plant growth which comprises applying to the plant environment an amount effective for substantially inhibiting the growth of undesirable plants, said amount being not in excess of about ten pounds per acre, of a heterocyclic tertiary aminoalkyl ether of the formula:

where Y is a C_{8-12} hydrocarbon radical;

"*n*" is an integer of 1 to 3;

R is lower alkylene; and

is morpholino.

3,871,864

HERBICIDE

Adolf Fischer, Mutterstadt; Siegfried Behrendt, Wachenheim, and Bernd-Heinrich Menck, Schilfferstadt, all of Germany, assignors to Badische Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Jan. 31, 1973, Ser. No. 328,470

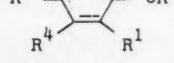
Claims priority, application Germany, Feb. 14, 1972, 2206861

Int. Cl. A01n 9/14

U.S. Cl. 71—91 2 Claims

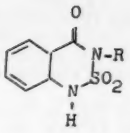
1. A herbicide composition comprising a herbicidally effective amount of a mixture of a compound of the formula

a)



where R denotes hydrogen or acetyl, R^1 denotes lower alkyl of a maximum of 6 carbon atoms, R^2 denotes hydrogen or methyl, R^3 denotes nitro, and R^4 denotes hydrogen or methyl, and a compound of the formula

b)



where R denotes lower alkyl of a maximum of 4 carbon atoms, or a salt thereof with sodium, lithium, potassium, calcium, iron, methylamine, trimethylamine, ethylamine, diethanolamine, ethanolamine, dimethylamine, dimethylethanolamine, ethanolamine or cyclohexylamine in a weight ratio of *a* to *b* of 1:6 to 2:1.

3,871,865

ETHER AND SULFIDE META-SUBSTITUTED ANILIDES AND THEIR UTILITY AS HERBICIDES

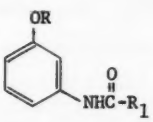
Eugene G. Teach, 1929 Downey Pl., El Cerrito, Calif. 94530

Division of Ser. No. 90,803, Nov. 18, 1970, abandoned. This application Mar. 21, 1973, Ser. No. 343,595

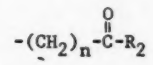
Int. Cl. A01n 9/20

U.S. Cl. 71—98 11 Claims

1. A method for controlling the growth of vegetation which comprises applying to the locus wherein control is desired, an herbicidally effective amount of a compound having the formula



in which R is ketoalkyl of the formula



in which *n* is 1 or 2 and R_2 is alkyl containing from 1 to 4 carbon atoms, inclusive, and R_1 is alkyl containing from 2 to 6 carbon atoms, inclusive.

3,871,866

HERBICIDE AND METHOD FOR CONTROLLING WEEDS

Warren H. Zick, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 1, 1971, Ser. No. 148,925. The portion of the term of this patent subsequent to Mar. 18, 1972, has been disclaimed.

Int. Cl. A01n 9/20

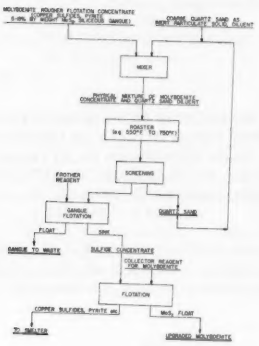
U.S. Cl. 71—106 20 Claims

1. A herbicidal composition containing herbicidally-effective amounts of both an alkyl N-phenylcarbamate or mixtures of alkyl N-phenylcarbamates and 2-chloro-2',6'-diethyl N-methoxymethyl)acetanilide and further containing a commpound selected from the group consisting of aryl N-alkylcarbamate, aryl N,N-dialkylcarbamate, aryl N-cycloalkylcarbamate, and mixtures thereof in an amount sufficient to extend the soil life of said alkyl N-phenylcarbamate or mixtures of alkyl N-phenylcarbamates.

3,871,867
ROAST-FLOTATION PROCESS FOR UPGRADING MOLYBDENITE FLOTATION CONCENTRATES

Arthur W. Last, Salt Lake City, and George L. Fraser, Magna, both of Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,167
Int. Cl. B03d *1/08*
U.S. Cl. 75—2 **11 Claims**



1. In a molybdenite recovery process applicable to a finely divided ore material containing molybdenite and sulfide minerals other than molybdenite, but relatively little gangue, which ore material has been previously treated by flotation and which process comprises roasting said ore material to deactivate sulfide minerals other than molybdenite and subjecting the roast product to flotation for the recovery of the molybdenite as a froth concentrate, the improvement which comprises mixing with said ore material under substantially ambient conditions a sufficient quantity of a particulate, solid diluent to prevent ignition of the roast at a temperature at which ignition would otherwise occur, said diluent being chemically inert with respect to the molybdenite and sulfide materials in said ore material; roasting the mixture of ore material and diluent at a temperature at which ignition would occur if said diluent were not present; and separating the diluent from the roasted ore material.

3,871,868
METHOD OF PREPARING A CORROSION-RESISTANT AND DUCTILE IRON ALLOY WITH A HIGH ALUMINUM CONTENT

Henri Renaud, 15, Avenue Maunoury, 41 Mer, France

Filed Feb. 4, 1972, Ser. No. 223,784
Claims priority, application France, Feb. 4, 1971, 71.04920
Int. Cl. C21c *7/00;* **C22c** *1/02*
U.S. Cl. 75—53 **1 Claim**

1. Process of preparing a casting of an iron alloy with a high aluminum content which has the composition:

total carbon	1.4	to	2%
aluminum	8	to	25%
silicon	1.8	to	2.6%
manganese	0.30%		
iron	(remainder)		

consisting of the following steps:

a. preparing an admixture having the composition:

total carbon	1.4	to	2%
aluminum	8	to	25%
manganese	0.30%		
iron	(remainder)		

b. heating said admixture to a temperature in the order of 1,600°C, a melt having formed thereby:

c. incorporating in said melt maintained at 1,600°C. an additive composition formed of:

⅓ magnesium fluoride
⅓ magnesium chloride and
⅓ of powdered calcium;

d. removing the slag from said melt;

e. completing the composition of said alloy by the addition of ferrosilicon in said melt after a period of rest of the order of five minutes following the removal of said slag; and

f. casting the melt to form said alloy.

3,871,869
PROCESS FOR PRESSING BRIQUETTES FROM POWDERED SUBSTANCES MORE PARTICULARLY FROM FINE-GRAINED FLUORSPAR AND BRIQUETTES THUS OBTAINED

Willem B. Overdijk, Velsen, and Adam Steen, Heemskerk, both of Netherlands, assignors to Hoogovens Ijmuiden B.V., Ijmuiden, Netherlands

Filed July 3, 1973, Ser. No. 376,161
Claims priority, application Netherlands, Oct. 2, 1972, 7201775
Int. Cl. C21c *7/00;* **C21b** *1/08;* **C04b** *7/02*
U.S. Cl. 75—53 **7 Claims**

1. A process for producing pressed briquettes comprising mixing powdered fluorspar with from 0.5 to 6% by weight of molasses and 0.5 to 5% by weight of cement and compressing the resultant mixture into briquettes.

3,871,870
METHOD OF ADDING RARE EARTH METALS OR THEIR ALLOYS INTO LIQUID STEEL

Hidetaro Nemoto; Takaho Kawawa, both of Tokyo; Hideki Sato, Yokohama; Eiichi Sakamoto, Kamakura; Takayuki Koyano, Tokyo, and Takanori Anzai, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1973, Ser. No. 356,087
Int. Cl. C21c *7/00*
U.S. Cl. 75—58 **3 Claims**

1. In a continuous casting process using a succession of separate ladle, tundish and mold, the steps comprising

substantially completely deoxidizing molten steel in said ladle by addition of aluminum, silicon, manganese or any combination thereof;

thereafter pouring said molten steel into said separate tundish having means for preventing oxidation of said steel therein;

adding a rare earth metal selected from the group consisting of La, Ce, Pr and Nd, any alloy thereof or any combination thereof, in the ratio of rare earth metal to sulfur of between 1.2 and 2.0 and in the form of a wire of a diameter of at least 2.0 to 4.0 mm, deeply into said substantially completely deoxidized steel contained in said tundish, without being exposed to oxidation, said adding being at the rate of at least 0.05 m/sec; and

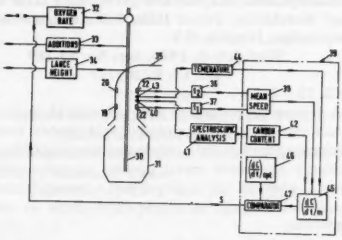
thereafter passing said molten steel to said separate mold having means for preventing oxidation thereof, thereby to produce a steel having improved impact strength.

3,871,871

MONITORING AND CONTROL OF PIG IRON REFINING

Etienne Marie Denis, Grivegnee, and Roland Holper, Seraing, both of Belgium, assignors to Centre National De Recherches Metallurgiques, Brussels, Belgium

Continuation-in-part of Ser. No. 782,032, Dec. 9, 1968, abandoned. This application Apr. 28, 1971, Ser. No. 138,152
Claims priority, application Luxembourg, Dec. 11, 1967, 55064
Int. Cl. C21c *5/30*; B21d *28/00*; G01n *21/26*
U.S. Cl. 75—60 13 Claims



1. A method of monitoring and controlling a pig iron refining operation in which an oxygen-containing gas is blown from above by means of a lance onto a bath of molten pig iron in a vessel, refining agents are fed into the vessel, and the gases leaviing the vessel are withdrawn through a hood; the refining operation taking place under regulable refining conditions comprising the height of the lance above the bath, the rate of flow of gas through the lance, and the rate at which refining agents are fed in; the method comprising the steps of

i. automatically determining the means speed of said gases at a given position in the hood at which the CO in said gases has burnt to CO_2 and prior to dust removal or drying of said gases, by

a. automatically measuring the time taken by an acoustic wave to travel through said gases from an emitter to a receiver upstream of the emitter,

b. automatically measuring the time taken by an acoustic wave to travel through said gases from an emitter to a receiver downwstream of the emitter, and

c. transmitting said time measurements to a computing device adapted to calculate said mean speed from said time measurements;

ii. automatically determining the carbon content of said gases at said given position by spectrographic analysis;

iii. automatically measuring the temperature of said gases at said given position;

iv. transmitting the calculated value of the means speed, the determined value of the carbon content, and the measured value of the temperature to a computing device adapted to calculate the rate of decarburisation of said bath from said values;

v. automatically comparing the calculated valve of the decarburisation rate with a predetermined instantaneous optimum value;

vi. automatically generating a signal representative of the difference, if any, between said calaculated value and said predetermined instantaneous optimum value; and

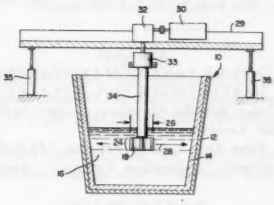
vii. automatically regulating at least one of said regulable refining conditions in accordance with said signal so as to reduce or annul said difference.

3,871,872

METHOD FOR PROMOTING METALLURGICAL REACTIONS IN MOLTEN METAL

James H. Downing, Clarence, and Robert H. Kaiser, Youngstown, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 30, 1973, Ser. No. 365,310
Int. Cl. C21c *7/00*
U.S. Cl. 75—61 3 Claims



1. A method for refining molten metal containing impurities which comprises

i. introducing molten metal into a substantially cylindrically shaped vessel

ii. agitating the molten metal in said vessel by means of a graphite rotating agitating member substantially centrally and axially aligned within said vessel with the bottom portion of said agitating member being in the upper 50 percent of the height of the metal bath, said agitating member being rotated at a speed of from about 120 to 225 r.p.m. to provide turbulent agitation at least at the surface of the metal bath and said agitating member comprising a substantially cylindrical hub portion having from three to eight radial extensions, the length of said radial extensions being from about 25 to 85 percent of the diameter of the hub, the width of said radial extensions being about 40 to 80 percent of their length, and the height of said radial extensions being from about 75 to 200 percent of the hub diameter and the diameter of a circle circumscribing said radial extensions being about 25 to 40 percent of the diameter of said vessel containing said molten metal.

3,871,873

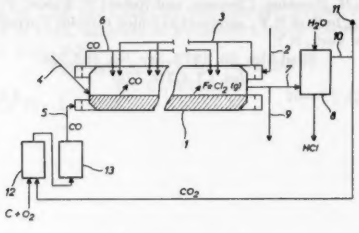
METHOD FOR PRODUCING NICKEL BY SEGREGATION OF ITS OXIDE ORES

Maurice Rey, Paris, France, assignor to "Le Nickel" and "Societe Miniere et Metallurgique de Penarroya", both of Paris Cedex, France

Filed Nov. 6, 1973, Ser. No. 413,265
Claims priority, application France, Nov. 6, 1972, 72.39190
Int. Cl. C22b *23/02*
U.S. Cl. 75—82 11 Claims

1. A method for producing nickel by segregation of nickel oxide ore comprising mixing said ore with a carbonaceous material and a chloridizing material, introducing said mixture into a non-fluidized bed furnace, and internally heating said

furnace to a temperature of about 800° to 1050° C by burning a combustible gas in said furnace containing at least 75 volume percent carbon monoxide, said combustible gas being substantially free from hydrogen and steam.



3,871,874

PURIFICATION OF VANADIUM-CONTAINING $TICL_4$ BY HEATING WITH $TICL_20.33\ ALCL_3$

Gerhard Winter, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 2, 1973, Ser. No. 347,584

Claims priority, application Germany, Apr. 15, 1972, 2218361

Int. Cl. C22b *53/00*

U.S. Cl. 75—84.5 **7 Claims**

1. A process for the purification of vanadiumcontaining titanium tetrachloride which comprises heating vanadium-containing titanium tetrachloride to a temperature of about 120° to 180°C in the presence of $TiCl_3 \cdot 0.33\ AlCl_3$, and separating the resulting vanadium-free $TiCl_4$ from the solids.

3,871,875

FLUX COMPOSITION AND A CENTRIFUGAL CASTING PROCESS USING THE SAME

Reizo Yokota, Hirakata, Japan, assignor to Yodogawa Steel Works Ltd., Osaka-shi, Osaka-fu, Japan

Filed Dec. 15, 1972, Ser. No. 315,499

Int. Cl. C22b *9/10*

U.S. Cl. 75—94 **1 Claim**

1. A flux composition adapted for use in the Centrifugal casting of a composite roll from a metal melt, said composite roll having a core portion and a shell portion directly bonded to said core portion, said flux consisting essentially of, in weight percent of the total, from 5 to 20% of a metallic element selected from aluminum, silicon and magnesium, from 30 to 45% of a mixture of borax and silica sand and from 65 to 35% of a fluidizing agent selected from sodium compounds, fluorides and mixtures thereof.

3,871,876

DENTAL AMALGAM

Kamal Asgar, 1351 Glendaloch Circle, Ann Arbor, Mich. 48104 and Steven H. Reichman, 1330 Orkney Dr., Ann Arbor, Mich. 48103

Filed Mar. 18, 1974, Ser. No. 451,840

Int. Cl. C22c *5/00, 7/00*

U.S. Cl. 75—169 **9 Claims**

1. An amalgamable silver alloy powder in which each of the particles are of substantially the same composition and consist essentially of silver, tin and copper; said silver and tin being present at a ratio of from about 1.8:1 to about 3.0:1 and said tin and copper being present at a ratio of about 1:1 up to 3:1, said powder further characterized as being of an average particle size less than about 100 microns and wherein each particle is of a gradient composition on moving from the surface toward the core thereof.

5. A dental amalgam consisting essentially of a continuous matrix composed of an amalgam having interspersed therethrough a plurality of discrete phases chemically bonded by said continuous phase into an integral matrix, said discrete phases comprising particles of an alloy consisting essentially of silver, tin and copper and wherein the particles are of a gradient composition on moving from the surfaces thereof toward their center, said continuous phase comprising intermetallic compounds of mercury with silver, tin and copper; said dental amalgam containing from about 42% to about 54% mercury, and said silver, tin and copper being present in amounts so as to provide a ratio of silver-to-tin of from about 1.8 up to about 3.0 and tin-to-copper of from about 1:1 up to 3:1.

3,871,877

PRODUCING ALUMINUM POWDER COMPACTS

Samuel Storchheim, Forest Hills, N.Y., assignor to Sinteral Corporation, Jamaica, N.Y.

Filed July 8, 1970, Ser. No. 53,289

Int. Cl. B22f *3/12*

U.S. Cl. 75—214 **2 Claims**

1. A process for producing a high density aluminum powder compact capable of being sintered, said process comprising:

a. forming a bulk metal particle mixture containing predominantly aluminum metal powder particles wherein the metal particles are in direct metal-to-metal contact, said particles ranging in shape from chips to needles to spheres;

b. applying to the walls of a powder compacting die a coating of a normally liquid methyl alkyl polysiloxane having a molecular weight of between about 1500 and about 10,000, the alkyl radicals in said methyl alkyl polysiloxane being selected one the group consisting of linear alkyl radicals ranging from to 40 carbon atoms in length;

c. charging the mixture of aluminum metal powder particles formed in step (a) to the powder compacting die whose walls have been treated with the methyl alkyl polysiloxane according to step (b);

d. compacting the aluminum metal powder particles charged to the powder compacting die in step (c) under pressure to form a green compact having a strength of at least about 5,000 p.s.i. at 93 percent theoretical density; and

e. sintering the green compact formed in step (d).

3,871,878

ELECTROPHOTOGRAPHIC OR XEROGRAPHIC METHOD FOR TREATING A PICTURE IMAGE

Masayuki Mino, Sakai-shi, Osaka-fu, and Kuniki Seino, Kawasaki-shi, Kanagawa-ken, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 2, 1973, Ser. No. 356,698

Claims priority, application Japan, May 25, 1972, 47-051915

Int. Cl. G03g *13/22*

U.S. Cl. 96—1 R **11 Claims**

1. The method of producing a composite picture comprising the steps of producing a reversed electrostatic latent primary image on a substrate by forming said primary image at a predetermined polarity on said substrate and thereafter reversing the polarity of said first latent image, directing on said latent image carrying substrate a secondary image to produce a resultant latent electrostatic image which is a function of said primary and secondary images and developing said resultant latent electrostatic image.

3,871,879

METHOD OF FORMING COLORED COPIED IMAGE

Akio Arai, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,146
Claims priority, application Japan, Jan. 19, 1973, 48-7889
Int. Cl. G03g 13/22
U.S. Cl. 96—1.2 10 Claims

1. In a method of forming a colored copied image on a transfer sheet by repeating a cycle comprising (1) forming an electrostatic latent image on an electrophotographic copying material having a photoconductive layer, (2) transferring said electrostatic latent image onto a transfer sheet having a dielectric layer which is an insulating resin and (3) developing the thus transferred electrostatic latent image for each primary color constituting the colored original image; the improvement comprising employing a transfer sheet having a photoconductive dielectric layer upon which the image is developed and applying active radiant rays to the whole surface of said dielectric layer between successive cycles to dissipate residual charge from a previous cycle.

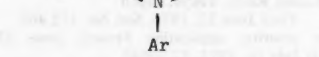
3,871,880

ORGANIC PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY

Jean-Pierre Montillier, Manchester, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 1, 1972, Ser. No. 311,221
Int. Cl. G03g 5/06, 7/00
U.S. Cl. 96—1.5 3 Claims

1. A photoconductive electrically insulating composition comprising a charge transfer complex of a Lewis acid and an N-aryl carbazole, characterized by the structural formula:



wherein X and Y are each selected from the group consisting of N, Cl, Br, and NO; wherein Ar is selected from the group consisting of phenyl, naphthyl and phenanthryl; wherein said Lewis acid is taken from the group consisting of 2,4,7-trinitro-9-fluorenone; 2,4,5,7-tetranitro-9-fluorenone; 2,6-dichloro-p-benzoquinone; 2,5-dinitro-9-fluorenone; 1,5-dichloro-2,4-dinitrobenzene; 2,5-dichloro-p-benzoquinone; 2,3,6-trichloro-p-benzoquinone; 2-chloro-3, 5-dinitropyridine; 2,4,5,7,9-pentanitroindene; 2,1-alpha 7-fluorene-11, 12-dione; 2,5-diphenyl-p-benzoquinone; 2,3-dichloro-1, 4-naphthoquinone; 3-dicyanomethylene-2,4,7-trinitro-fluorene; and the molar ratio of the N-aryl carbazole to the Lewis acid is in the range of 1:0.5 to 1:1and there is included a dicarbazolyl cycloalkane in an amount sufficient to prevent crystallization of the composition.

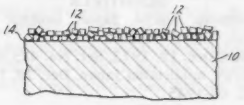
3,871,881

COATED ALUMINUM SUBSTRATES HAVING A BINDER OF ALUMINUM HYDROXYOXIDE

Valdis Mikelsons, Mendota Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 12, 1973, Ser. No. 331,372
Int. Cl. G03g 5/04, 7/00; G03c 1/76, 3/00, 1/94; B05c 1/00
U.S. Cl. 96—1.5 16 Claims

1. An article comprising an aluminum substrate bearing a layer of particulate material, said particulate material being bound to said substrate by an in situ formed binder of aluminum hydroxyoxide, said particulate material having an average particle size of about 0.05 to 3000 microns, a melting



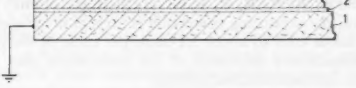
point above about 150°C., and a water solubility of less than about 0.1 part per 100 parts of water at 100°C.

3,871,882

ELECTROPHOTOGRAPHIC RECORDING MATERIAL

Wolfgang Wiedemann, Geisenheim-Johannisberg, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Apr. 25, 1973, Ser. No. 354,190
Claims priority, application Germany, July 31, 1972, 2237539
Int. Cl. G03g 5/06
U.S. Cl. 96—1.5 14 Claims



1. Electrophotographic recording material comprising an electroconductive support and a photoconductive double layer of organic materials thereon, said double layer being composed of a tightly packed, homogeneous, uniform, opaque, charge carrier producing dyestuff layer of a compound corresponding to the general formula

wherein

A is oxygen or =NR (imide nitrogen) in which

R is hydrogen, lower alkyl with one to four carbon atoms, an aryl group, an N-substituted heterocyclic group, or —NHR′, with

R′ being either a phenyl group or benzoyl,

and a transparent top layer of insulating materials containing at least one charge transporting compound, in which the transparent top layer is composed of a mixture of a binder with a charge-transporting, monomeric heterocyclic compound having an extended π-electron system which is substituted by at least one dialkylamino group or by two alkoxy groups, or with a condensation product of 3-bromopyrene and formaldehyde.

3,871,883

ELECTROPHOTOGRAPHIC PHOTOCONDUCTIVE LAYER COMPRISING AN ORGANIC PHOTOCONDUCTOR AND A DICYANOMETHYLENE-INDENOTHIOPHENE SENSITIZER

Mitsuru Hashimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

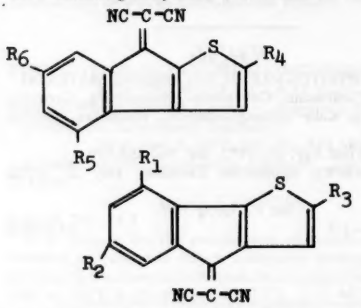
Filed Dec. 19, 1973, Ser. No. 425,967

Claims priority, application Japan, Dec. 28, 1972, 48-1944; Dec. 28, 1972, 48-1945

Int. Cl. G03g *5/06*

U.S. Cl. 96—1.5 **5 Claims**

1. An electrophotographic light-sensitive material having a photoconductive layer formed on an electroconductive support, the photoconductive layer comprising an organic photoconductive monomer or an organic photoconductive polymer, and a sensitizing compound of the formula:



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are hydrogen or nitro groups wherein the sensitizing compound is present in an amount of from about 0.01 to about 1.2 mole per mole of the organic photoconductive monomer or per monomeric unit of the organic photoconductive polymer.

3,871,884

PHOTOCONDUCTIVE COMPLEX WITH HYDROXY-NITROBENZOIC ACIDS AND TRIARYLMETHANE DYES

Shoichi Matsumoto, and Kazuhiko Kurematsu, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 14, 1971, Ser. No. 207,981

Claims priority, application Japan, Dec. 16, 1970, 45-11880

Int. Cl. G03g *5/06*

U.S. Cl. 96—1.6 **5 Claims**

1. A photoconductive material for electrophotography comprising a blend of

a. a molecular charge transfer reaction product of poly-N-vinylcarbazole and tetrachloro-p-benzoquinone,

b. at least one benzoic acid derivative selected from the group consisting of 2-hydroxy-3,5-dinitrobenzoic acid, 2-hydroxy-3-nitrobenzoic acid and 2-hydroxy-5-nitrobenzoic acid, and

c. at least one triaryl methane dyestuff.

3,871,885

CRYSTALLINE PHOTO-POLYMERIZABLE COMPOSITION

Walter Raymond Hertler, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 144,629, May 18, 1971, abandoned, which is a continuation of Ser. No. 53,537, June 9, 1970, abandoned. This application Oct. 20, 1972, Ser. No. 299,471

Int. Cl. G03c *1/68, 1/70*

U.S. Cl. 96—35.1 **79 Claims**

1. A substantially dry, predominantly crystalline photoimageable composition in the form of a thin layer ranging from about 1 micron to about 1 millimeter in thickness, having substantially homogeneously distributed therethrough closely arrayed crystals consisting essentially of at least one

solid ethylenically unsaturated monomer melting in the range 25°to 100°C. and capable of forming a polymer having a degree of polymerization of at least 10 by free-radical initiated, chain propagating, addition polymerization, and

for each part by weight of monomer, 0.001 to 1 part by weight of an organic, light-sensitive, free-radical generating system free of aliphatic halogen which initiates and subsequently does not terminate the polymerization,

at least one component of which has an active light absorption band with a molar extinction coefficient of 100 or more measured in hexane in the range of 3300 to 8000 A, said composition having a crystallinity index of at least 0.2,

being photopolymerizable in atmospheric oxygen and capable of yielding a photoimage on receiving light totalling 2000 μj./sq.cm. or less, said light being active to cause said free-radical generating system to generate free radicals.

3,871,886

PHOTOCHROMIC COPYING METHOD

Jean Jules Achille Robillard, Vitry, France, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed June 21, 1973, Ser. No. 372,405

Claims priority, application France, June 27, 1972, 72.23184; July 10, 1972, 72.24945

Int. Cl. G03c *5/24, 1/52*

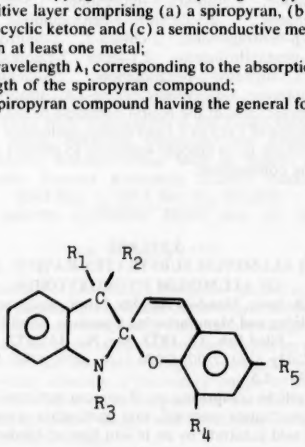
U.S. Cl. 96—48 R **7 Claims**

1. A copying method selected from the group consisting of:

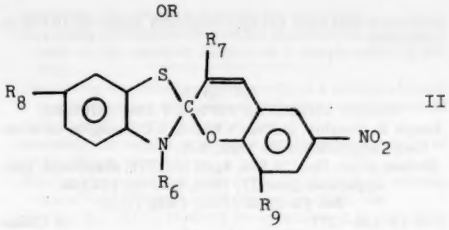
A. a first method which comprises imagewise exposure of a photochromic copying material to light rays having a wavelength λ_1, said copying material comprising a support and a photosensitive layer comprising (a) a spiropyran, (b) an aromatic or a cyclic ketone and (c) a semiconductive metal oxide doped with at least one metal;

said wavelength λ_1 corresponding to the absorption wavelength of the spiropyran compound;

said spiropyran compound having the general formula:



I



II

wherein:

R_1 and R_2 are alkyl containing 1 to 3 carbon atoms,

R_3 is alkyl containing 1 to 3 carbon atoms or phenyl,

R_4 is hydrogen, alkyl containing 1 to 3 carbon atoms, alkoxy containing 1 to 3 carbon atoms or halogen,

R_5 is hydrogen, halogen or nitro,

R_6 is alkyl containing 1 to 6 carbon atoms, or benzyl,

R_7 is alkyl containing 1 to 3 carbon atoms, naphthyl, phenyl, cyclohexyl, methoxyphenyl, hydroxyphenyl, halogen substituted phenyl or thiophenyl,

R_8 is hydrogen, hydroxyl, or thiomethyl, and

R_9 is hydroxyl or alkoxy containing 1 to 3 carbon atoms;

said ketone being selected from the group consisting of benzophenone, biphenyl-6-acetophenone, triketoindane, xanthotoxine and β-propiolactone;

said doped metal oxide being selected from the group consisting of TiO_2/TiO doped with Cu; TiO_2 doped with Ce/Ni, La/Ni or Ce/Cu; ZrO_2 doped with Ce/Ni, ZrO doped with La/Cu; and ZnO doped with Cu, Ce/Ni, Ni and La/Ni; and thereafter decomposing said ketone by exposure to light rays of wavelength λ_2, in the presence of an alcohol when said ketone is aromatic: and

B. a second method which is the reverse of said first method whereby the first exposure is to light of wavelength λ_2 and the second exposure is to light of wavelength λ_1.

3,871,887

PHOTOTHERMOGRAPHIC COMPOSITION, ELEMENT AND PROCESS

Cynthia G. Jones, Leroy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,364

Int. Cl. G03c *1/28*

U.S. Cl. 96—67 **20 Claims**

1. In a method of preparing a photothermographic composition comprising:

A. preparing a dispersion of:

a. an oxidation-reduction image-forming combination comprising:

i. a silver salt oxidizing agent and

ii. an organic reducing agent with:

b. a synthetic polymer-peptized photosensitive silver halide, and

c. a cyclic imide toner in

d. a non-gelatin polymeric binder, the improvement comprising:

B. mixing with said dispersion a sensitizing concentration of a non-silver iodide salt, said iodide salt having the property of increasing the photosensitivity of said photothermographic composition.

3,871,888

PHOTOSENSITIVE COMPOSITION CONTAINING A PROTOCHLOROPHYLLIDE-APOPROTEIN IN COMPLEXED OR IN ASSOCIATION WITH A POLYMERIC MATERIAL

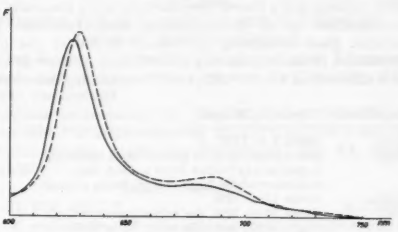
Marie-Rose Michel-Wolwertz, Vielle Voie de Liege 107, Dolembreux; Esther Dujardin, and Cyrille Sironval, both of Avenue des Bois 8, Mery-Esneux, all of Belgium

Filed Jan. 24, 1973, Ser. No. 326,442

Claims priority, application Great Britain, Jan. 25, 1972, 3499/72

Int. Cl. G03c *1/00*

U.S. Cl. 96—88 **6 Claims**



1. A process for preparing a photoactive material of biological origin remaining photoactive at room temperature which comprises the steps of

a. extracting from an etiolated plant material a photoactive protochlorophyll(ide)-apoprotein binary complex with a buffer solution at a pH between 7 and 10 in the presence of an agent to protect the apoprotein against denaturation at a temperature of at most 5°C;

b. adding to said binary complex at a temperature of at most 5°C a natural or synthetic polymeric material selected from the group consisting of polyethylene glycol, polyvinylpyrrolidone and dextran to form a precipitate;

c. cold-centrifuging said precipitate of said binary complex to form a product which is either in complexed or in association with said polymeric material, and

d. lyophylizing said product at a temperature of at most 5°C so that the dried final product remains photoactive at room temperature.

3,871,889

ACTIVATOR SOLUTIONS, THEIR PREPARATION, AND USE IN ELECTROLESS PLATING OF SURFACES

Earl J. Fadgen, Jr., Clinton, and Juan Hajdu, Orange, both of Conn., assignors to Enthone, Inc., West Haven, Conn.

Filed Oct. 29, 1973, Ser. No. 410,645

Int. Cl. C23c *3/00*

U.S. Cl. 106—1 **35 Claims**

1. A catalyst solution comprising a substantially colloidal metal particle-free acidic liquid solution containing a soluble lower alkanol-modified noble metal-tin chloride complex, and hydrochloric acid, the soluble lower alkanol-modified noble metal-tin chloride complex being obtained by mixing together a lower alkanol, a soluble noble metal chloride, stannous chloride and hydrochloric acid, and maintaining the thus-obtained liquid mixture at a reaction temperature of at least about 160°F. but below that temperature at which an excessive amount of noble metal is precipitated for a period sufficient to obtain a catalytically effective solution containing the soluble lower alkanol-modified noble metal-tin chloride complex, the stannous chloride being present in excess of the amount thereof required to reduce the noble metal chloride to zero valent noble metal, the molar ratio of stannous chloride to noble metal chloride (calculated as palladium chloride) being initially at least about 9-10:1 respectively, and the lower alkanol being present in amount sufficient to obtain a soluble complex.

3,871,890
COMPOSITION AND PROCESS FOR GLAZING CERAMIC WARE

Richard Andrew Eppler, Timonium, and Eugene F. O'Conor, Baltimore, both of Md., assignors to SCM Corporation, Cleveland, Ohio

Division of Ser. No. 207,522, Dec. 13, 1971, Pat. No. 3,804,666. This application Nov. 19, 1973, Ser. No. 417,126

Int. Cl. C03c *3/04, 5/02;* **C04b** *33/00*

U.S. Cl. 106—48 **7 Claims**

1. As component for glazing low-expansion ceramic whiteware with a substantially non-porous, acid-resistant, opaque glaze, a substantially water-insoluble ceramic frit being substantially entirely in the vitreous state as frit particles, said frit after melting into a fluent vitreous state being thermally autocrystallizable to a low-expansion, semi-crystalline glass-ceramic glaze containing zirconia or zircon as one of the crystalline phases and having a coefficient of thermal expansion of less than 5×10^{-6}/°C., said frit consisting essentially of:

Ingredient	Percent by Weight
Li_2O	about 3 to 22%
MgO	about 0 to 6%, 0.74 part of MgO replacing 1 part of Li_2O when MgO is used, but a minimum of 4% Li_2O + MgO being present
Al_2O_3	about 17 to 38%
SiO_2	about 26 to 70%, the subtotal sum of Li_2O, MgO, Al_2O_3 and SiO_2 being 70 to 90%
ZrO_2	about 6 to 25%
Flux	about 4 to 19%.

wherein said flux is selected from the group consisting of: B_2O_3, K_2O, F, PbO, Na_2O, CaO, SrO, ZnO, BaO up to 5% or mixtures of same.

3,871,891
METHOD FOR THE PRODUCTION OF HIGHLY WEAR-ESISTANT CERAMIC MATERIAL

Karl-Heinz Schuller, and Horst Nink, both of Lauf/Pegnitz, Germany, assignors to Rosenthal Stemag Technische Keramik AG, Selb, Germany

Filed Dec. 14, 1973, Ser. No. 424,749

Claims priority, application Germany, Mar. 23, 1973, 2314442

Int. Cl. C04b *35/10*

U.S. Cl. 106—65 **7 Claims**

1. Method for the production of highly wear-resistant bodies of Al_2O_3 ceramic material, characterized by the succession of the following operating steps:

a. preparing a mixture consisting of 100 parts by weight of at least 98% pure Al_2O_3 and 10 to 50 parts by weight of a carbonaceous plasticizer;

b. heating the mixture in a hot press at a rate of at least 50° C./minute to a temperature between 1,280° and 1,500° C. and pressure sintering with a holding time of at least 5 minutes at a maximum temperature; and

c. cooling the mixture.

3,871,892
SHAPED BODIES OF PULLULAN ESTERS AND THEIR USE

Hiromi Hijiya, and Makoto Shiosaka, both of Okayama, Japan, assignors to Hayashibara Biochemical Laboratories, Incorporated, Okayama, Japan

Filed Dec. 12, 1973, Ser. No. 424,151

Claims priority, application Japan, Dec. 18, 1972, 47-126949; Dec. 22, 1972, 47-128971

Int. Cl. C08h *1/00, 7/00*

U.S. Cl. 106—126 **6 Claims**

1. A shaped solid body essentially consisting of a pullulan ester of a fatty acid having up to 18 carbon atoms or benzoic acid, or of a mixture of said ester with at least one member of the group consisting of up to 120% amylose and up to 150% gelatin, said percent being by weight of said pullulan ester, the pullulan in said ester having a molecular weight of 10,000 to 5,000,000.

3,871,893
LIGNIN AMINES AS ASPHALT EMULSIFIERS

Joseph B. Doughty, Sullivan's Island, S.C., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 134,856, April 16, 1971, abandoned. This application June 21, 1972, Ser. No. 264,864

Int. Cl. C08h *13/00;* **C08k** *1/162*

U.S. Cl. 106—277 **4 Claims**

1. An oil-in-water cationic bituminous emulsion of improved mechanical stability which comprises, from about 30 to about 75% by weight of bitumen as the dispersed phase, from about 0.2 to about 2.5% by weight of a watersoluble salt of a lignin amine product of the reaction of from 1 to 10 moles of a glycidyl/tertiary amine intermediate per 1000 grams lignin as the cation active emulsifier for dispersing said bitumen in water and water to make up 100% by weight as the continuous phase, the pH of the emulsion being adjusted to a value in the range from about 1 to 3.

3,871,894
COATED CHROMATE PIGMENT COMPOSITIONS AND PROCESS FOR PRODUCING THE SAME

Shigenaga Kubo, Tokyo, and Nobuyoshi Abe, Saitama, both of Japan, assignors to Nippon Chemical Industrial Co., Ltd., Tokyo, Japan

Filed May 17, 1973, Ser. No. 361,084

Claims priority, application Japan, May 18, 1972, 47-48532; May 19, 1972, 47-49201; June 7, 1972, 47-56088

Int. Cl. C09c *1/08, 1/20, 1/34*

U.S. Cl. 106—302 **19 Claims**

1. A pigment composition comprising chromate particles having deposited thereon a zirconium compound in an amount 0.2–5% by weight (calculated as ZrO_2) based on the total amount of chromate particles plus zirconium compound, and also having deposited thereon silica.

13. A pigment composition comprising chromate particles having deposited thereon a zirconium compound in an amount of 0.2 – 10 percent by weight (calculated as ZrO_2) based on the total amount of chromate particles plus zirconium compound, and also having deposited thereon a water-insoluble antimony compound.

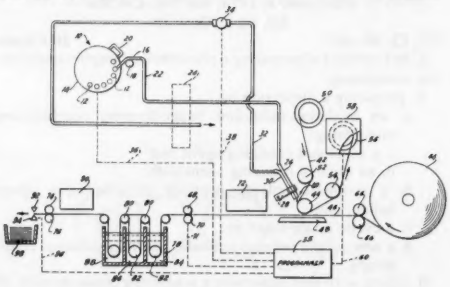
3,871,895
METHOD FOR PREPARING SMEARS OF BIOLOGICAL LIQUIDS

Stanford L. Adler, Monsey, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed June 29, 1973, Ser. No. 375,291

Int. Cl. B44d *1/02*

U.S. Cl. 117—3 **7 Claims**



1. A method of preparing a smear on a substrate element, utilizing a ribbon element, comprising:

supporting the substrate element for movement,
supporting said ribbon element for movement in close proximity to the substrate element at a sample-applying station,
introducing a relatively small quantity of a biological liquid sample between said ribbon and substrate elements at said sample applying station,
spreading the sample across at least the central portion of said ribbon element,
drawing the sample on said substrate element by moving one of said elements relatively to the other, and
moving the ribbon element by advancing it to present a fresh portion thereof to said sample-applying station.

3,871,896
PRECOATED METAL SHEETS AND MANUFACTURE THEREOF

Tadashi Matsudaira, and Minoru Namiki, both of Hiratsuka, Japan, assignors to Kansai Paint Company Limited, Amagasaki-shi, Hyogoken, Japan

Filed Oct. 4, 1972, Ser. No. 294,917
Claims priority, application Japan, Oct. 11, 1971, 46-80405
Int. Cl. B32b *15/04*
U.S. Cl. 117—6 **2 Claims**

1. A precoated metal sheet for producing a metal working product which comprises a base metal sheet, a coating film of a thermosetting resin which is formed on the base metal sheet and cured to semi-hardened state having a tackiness of from 2.0 to 40 g/cm width at a temperature of 25°C and at a relative humidity of 75% and a polyolefin sheet removably adhered to the above semi-hardened coating film; said base metal sheet being one species selected from the group consisting of mild sheet, aluminum sheet, chromium-plated steel sheet and zinc-plated steel sheet; said thermosetting resin being one species selected from the group consisting of

1. thermosetting acrylic resin containing hydroxyl group in the molecule and having an acid value of 5 to 20and hydroxyl value of 10 to 70, 100 parts by weight of this resin being used with 20 to 60 parts by weight of melamine-formaldehyde resin and/or not more than 20 parts by weight of bisphenol A — epichlorohydrine type epoxy resin having an epoxy equivalent of 300 to 800,
2. alkyd-melamine resin comprising 100 parts by weight of alkyd resin modified with non-drying oil and/or non-drying oil fatty acid and having an oil length of 10 to 30 and 20 to 60 parts by weight of melamine-formaldehyde resin,
3. bisphenol A—epichlorohydrine type epoxy resin having an epoxy equivalent of 800 to 4,000 100 parts by weight of this resin being used with 20 to 60 parts by weight of butyl-etherified phenol-formaldehyde resin or with 20 to 60 parts by weight of butyl-etherified urea-formaldehyde resin, and
4. oil free polyester-melamine resin comprising 100 parts by weight of oil free polyester having an acid value of 5 to 20 and hydroxyl equivalent of 400 to 1,300 and 20 to 60 parts by weight of melamine-formaldehyde resin modified with an aliphatic monoalcohol having from 1 to 4 carbon atoms.

3,871,897
FOAMED OLEFIN POLYMER WALLPAPER

Cyril John Ealding, Puckeridge, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 119,713, March 1, 1971, Pat. No. 3,839,238, which is a continuation-in-part of Ser. No. 724,237, April 25, 1968, abandoned. This application Mar. 6, 1973, Ser. No. 338,525
Int. Cl. B32b *27/32*
U.S. Cl. 117—15 **3 Claims**

1. Wallpaper comprising a foamed film of at least one olefin polymer selected from homopolymers of ethylene, propylene, butene-1 and 4-methyl pentene-1, and copolymers of at least two olefins selected from ethylene, propylene, butene-1 and 4-methyl pentene-1, having a printed repeating pattern on one side thereof, said film having

i. a thickness of from 0.014 to 0.065 in,
ii. a density of from 0.05 to 0.5 g cm^{-3},
iii. an average cell diameter of from 120 to 250 μm,
iv. an air permeability of at least 0.0075 ml cm^{-2} sec^{-1} cm $head^{-1}$ mil thickness,
v. a water vapour permeability of from 500 to 10000 g m^{-2} day^{-1} mil thickness, and
vi. at least 50% of the volume of the film comprising open cells.

3,871,898
PROCESS FOR THE OPTICAL BRIGHTENING OF ORGANIC FIBRE MATERIAL

Gerhard Reinert, Allschwil/Basel-land, and Alois Kleemann, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 72,210, Sept. 14, 1970, abandoned. This application Aug. 23, 1971, Ser. No. 174,155
Claims priority, application Switzerland, Nov. 14, 1969, 16959/69
Int. Cl. C09k *1/02*
U.S. Cl. 117—33.5 T **10 Claims**

1. A process for the non-aqueous optical brightening of organic fibre material by the exhaustion method, which essentially comprises the steps of

a. treating said fibre material, at a goods: liquor ratio of at least 1:5 in the solution of
I. at least one optical brightener salt consisting of the anionic radical of an anionic optical brightener and at least one cationic radical of an inorganic base,
II. a solvent mixture consisting of
α. from 50 to 99 percent by weight of halogenated hydrocarbon boiling between 50° and 150°C, the balance consisting of
β. a liquid, water-soluble organic solvent boiling below 220° C and selected from the group consisting of alkanols, cyloaliphatic alcohols, araliphatic alcohols, aliphatic and cycloaliphatic ketones, alkylene glycol monoalkyl ethers, furfuryl alcohol, tetrahydrofurfuryl alcohol, lower cyclic ethers, lower anhydrous monocarboxylic acids, N,N-dialkylamides of lower monocarboxylic acids, amides of carbonic acid, cyclic amides, lower carboxylic acid nitriles, and mixtures thereof which are soluble in water, at a temperature between room temperature and the boiling point of the solvent mixture, optionally under pressure, and
b. finishing the brightened fibre material by removing excess solvent and drying.

3,871,899
DUPLICATOR STENCIL

John V. Andersen, Maalov, Denmark, assignor to Aktieselskabet For Kantor Kemi, Glostrup, Denmark

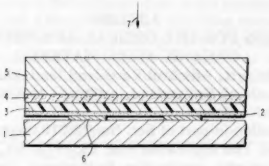
Continuation-in-part of Ser. No. 51,041, Jun. 30, 1970, abandoned. This application Oct. 3, 1972, Ser. No. 294,697
Claims priority, application Denmark, July 11, 1969, 3750/69; Apr. 29, 1970, 2157/70
Int. Cl. B41n *1/24*; **B44d** *3/30*
U.S. Cl. 117—35.5 **4 Claims**

1. A duplicator stencil adapted to be perforated through heat action in selected areas, comprising a film of a thermoplastic resin carrying on the surface thereof, which is to be exposed to heat action, coating consisting essentially of the following ingredients:

a. a softener for said synthetic resin selected from the group consisting of dioctyl phthalate, tricresyl phosphate, trixylyl phosphate, polyphenyl chlorides and di-cyclohexyl phthalate in an amount which promotes the rapidity and

lowers the temperature of perforation of said film material when the film material is exposed to heat action;

b. a substance influencing the surface property of said film material and selected from the group consisting of isobutylene-naphthalene-sulfuric acid sodium, derivatives of fatty-acid-dibutyl-amide, poly-dimethyl-siloxane, methyl-silicone-polymers, polymer tetra-alkylsilanes, polyethylene glycols and ethanolized alkyl-guanidine-amine-complexes in an amount to make it more supple under the influence of heat action so as to allow a complete contact with



the original to be stenciled, and to insure an easy separation of the original and stencil after heat perforation of the latter; said components (a) and (b) not being the same; and

c. an inorganic finely divided powder in an amount effective to eliminate any residual tackiness of the film material and to impart sharp contours to the perforations, said ingredients (a), (b) and (c) having the capability and being present in amounts effective to facilitate penetration and rapid perforation of the film at places where the film is exposed to a source of heat.

3,871,900
RECORDING SHEET

Takao Hayashi; Hajime Kato, both of Minami Ashigara-shi, Shizuoka, and Sadao Ishige, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Fujinomiya-shi, Kanagawa, Japan

Filed July 24, 1973, Ser. No. 382,224
Claims priority, application Japan, July 28, 1972, 47-75758
Int. Cl. B41m *5/00*
U.S. Cl. 117—36.8 **19 Claims**

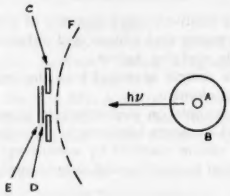
1. A recording sheet comprising a support having thereon a color developer layer capable of reacting with a color former to form color images, said color developer layer containing (1) a metal salt of an aromatic carboxylic acid and (2) at least one member selected from the group consisting of ethers and alcohols, said component (1) and said component (2) being present at a proportion sufficient to increase the color-developing ability of said color developer and said color former.

3,871,901
PHOTOSTABILIZATION OF POLYMERS

David J. Carlsson; Tony Suprunchuk, and David M. Wiles, all of Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed June 29, 1972, Ser. No. 267,461
Claims priority, application Canada, July 2, 1971, 117203
Int. Cl. B44d *1/32, 1/092*
U.S. Cl. 117—47 A **24 Claims**

1. Thin films, fibres, and filaments of polymeric material having high surface area in relation to volume stabilized against the degradative effects of actinic radiation, which comprises said polymeric material having a continuous thin surface layer containing an energy transfer agent which is a metal coordination compound containing at least one metal atom and a ligand comprising a cyclic olefin or a ligand which contains an electron donor atom of nitrogen, oxygen or sulfur,



the amount of energy transfer agent in the layer being at most 0.5% by weight based on the weight of the polymeric material.

3,871,902
METHOD OF COATING A SPACECRAFT SHELL SURFACE

Charles Z. Leinkram, Bowie, and Robert S. Rovinski, Forest Heights, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 22, 1973, Ser. No. 343,771
Int. Cl. C23d *5/00;* **C23b** *5/26*
U.S. Cl. 117—49 **4 Claims**

1. A method of coating a spacecraft shell surface to improve the optical qualities thereof by providing a low solar absorptivity, α_s, with a relatively high spacecraft shell emissivity, ϵ, and to provide good electrical insulation for securing solar cells thereto which comprises,

cleaning said surface to be coated,

polishing said cleaned surface to a high gloss,

coating said polished surface with a liquid glass solution such as a lead silica film,

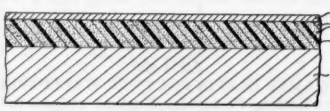
baking said liquid glass solution coated surface at a temperature of from about 100° to 250°C for a period of from about 1 hour to about 3 hours to densify said glass solution,

continuing said coating and baking steps until a coating thickness of about 5 microns with an α_s/ϵ ratio of about 0.46 is obtained.

3,871,903
METALLIZED SHAPED BODY OF MACROMOLECULAR MATERIAL

Wilhelm Brandt, Wertach, and Irmgard Bindrum, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Division of Ser. No. 231,825, March 6, 1972. This application Aug. 2, 1973, Ser. No. 385,147
Int. Cl. B44d *1/14, 1/18*
U.S. Cl. 117—71 R **5 Claims**



1. A shaped body comprising a solid support being thermally resistant in the temperature range between 250° to 400°C,

a sintered film, on the surface of said support, of polytetrafluoroethylene having a noble metal salt dispersed therein,

and a metal coating on the surface of said noble metal salt-containing sintered polytetrafluoroethylene film.

3,871,904

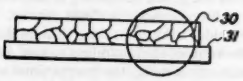
METHOD FOR PROVIDING A LIQUID CRYSTALLINE FILM

Werner E. L. Haas, Webster; James E. Adams, Ontario, and Bela Mechlowitz, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 173,532, Aug. 20, 1971, Pat. No. 3,803,050. This application Nov. 9, 1973, Ser. No. 414,473

Int. Cl. G02f 1/16

U.S. Cl. 117—72 5 Claims



1. A method for providing a spontaneously aligned liquid crystalline film comprising

providing a substrate; and

providing on said substrate a layer claim an aligned liquid crystalline composition comprising a smectic liquid crystalline material and an aligning agent, said aligning agent comprising a polyamide resin surfactant material, whereby said liquid crystalline composition spontaneously aligns with the major molecular axes of a substantial portion of the molecules of the liquid crystalline material substantially perpendicular to the plane of the substrate.

3,871,905

METHOD OF FORMING A PROTECTIVE, FLEXIBLE, INSULATING COATING FOR COVERING THE METAL CASTING SURFACE OF A FLEXIBLE CASTING BELT

Charles J. Petry, Winooski, Vt., assignor to Hazelett Strip-Casting Corporation, Winooski, Vt.

Filed Nov. 16, 1972, Ser. No. 307,216

Int. Cl. C09k 9/00

U.S. Cl. 117—75 1 Claim

1. A method of forming a protective, flexible, insulating coating for covering the metal casting surface of a flexible casting belt used for confining molten metal during a continuous metal casting operation, comprising roughening the metal casting surface, applying a first coating comprising finely divided carbon and finely divided refractory material carried in a thermosetting resin and organic solvent to the roughened metal casting surface, heat curing the first coating to form a thermally insulative uniform first layer adjacent to the metal casting surface, and applying a second coating covering the first coating comprising amorphous carbon and a resin binder in a quick-drying solvent to form a second layer to be adjacent to the metal being cast and serving to eliminate contact between the first layer and the metal being cast.

3,871,906

PROCESS FOR MAKING PARTICULATE SELF-DESTRUCTING PESTICIDAL COMPOSITIONS

Keith H. Sweeny, West Covina; James R. Fischer, Claremont; Charles A. Lung, Buena Park, and Elmer M. Wilson, Pasadena, all of Calif., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 100,985, Dec. 23, 1970, Pat. No. 3,767,783. This application Oct. 11, 1973, Ser. No. 405,709

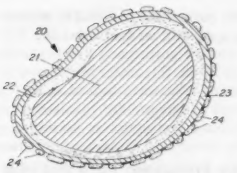
Int. Cl. B44d 1/14

U.S. Cl. 117—75 7 Claims

1. A process for making a composite, particulate, self-destructing pesticidal composition which comprises:

depositing a layer of solid, acid-producting material upon a central particulate core, said core comprising a metallic reductant, said metallic reductant being capable of reacting with chlorinated organic pesticides in an acidic environment to produce relatively innocuous degradation products;

forming a second layer around said acid producing material; said second layer comprising a material which serves to temporarily isolate said metallic core and said acid producing material from an external environment and which degrades after exposure to moisture, ultraviolet radiation or oxygen of a field environment for a predeterminated length of time, and



adhesively depositing a pesticide selected from the group consisting of DDT, toxaphene, lindane, methoxychlor, dieldrin, kelthane, chlordane, Perthane, endrin, aldrin, and heptachlor upon the exterior surface of said second layer.

3,871,907

DECORATIVE WALLCOVERING

Arthur Burton, Denton; Arthur John Naylor, Hazlemere, and John Anthony Handforth, Bollington, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 29, 1973, Ser. No. 364,633

Claims priority, application Great Britain, June 5, 1972, 26136/72

Int. Cl. B32b 29/00; B44d 1/14

U.S. Cl. 117—76 P 6 Claims

1. A decorative wallcovering comprising a paper sheet having on one of its surfaces, its decorative surface, a coating of a plasticized vinyl polymer, and, on the vinyl coating, two superimposed dry lacquer coatings, the first lacquer coating, being free of plasticizer, serving to reduce plasticizer migration from the plasticized vinyl coating and comprising a film-forming polymeric material having a glass transition temperature greater than 70° and selected from the group consisting of polymers and copolymers of vinyl chloride, vinyl acetate, styrene, vinyl acetals, methyl methacrylate, acrylonitrile and polyvinyl alcohol, the second lacquer coating also being free of plasticizer and comprising a film-forming polymeric material selected from the said group and in the second lacquer coating being dispersed from 90 to 480 parts by weight, per 100 parts by weight of the polymeric material, of a particulate inorganic material having a particle size in the range 2.5 millimicrons to 40 microns, the second lacquer coating serving to render the coated surface of the wall covering suitable for painting with a decorative paint.

3,871,908

PRODUCTION OF URETHANE GROUP CONTAINING COATINGS BY CURING WITH IONIZING RADIATION

Herbert Spoor, Limburgerhof, and Kurt Demmler, Ludwigshafen, both of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Dec. 28, 1971, Ser. No. 213,153

Claims priority, application Germany, Dec. 31, 1970, 2064701

Int. Cl. B44d 1/50; C08f 3/38

U.S. Cl. 117—93.31 10 Claims

1. A process for the manufacture of coatings which comprises: applying a coating composition containing an olefinically unsaturated, urethane group-containing polymeric material prepared by reacting oligomers or polymeric organic materials, which contain at least two free hydroxyl groups per molecule, with vinyl isocyanate to a substrate in admixture

with olefinically unsaturated monomeric compounds, said olefinically unsaturated, urethane group-containing polymeric materials containing at least two units of the formula

$$CH_2=CH-NH-\overset{\overset{O}{\|}}{C}-O-$$

and thereafter curing said material by means of ionizing radiation to form a coating on said substrate.

3,871,909

HOSIERY FINISHING PROCESS FOR TREATING FABRICS CONTAINING SPANDEX YARN

William E. Aldrich, Pittsford, Vt., assignor to Warnaco, Inc., Bridgeport, Conn.

Filed June 22, 1072, Ser. No. 265,318
Int. Cl. B44d *5/00*
U.S. Cl. 117—138.8 N **8 Claims**

1. A finishing process for treating fabrics containing spandex yarn comprising placing the fabric in a bath containing a water emulsion of a lower alkyl polysiloxane polymer, said polymer having an active hydrogen group, acidifying the bath, exhausting said polymer onto said fabric at a temperature of 100° to 200°F. for a period of 10 to 30 minutes to permit substantially uniform absorption of said polymer by the spandex in said fabric, adding dimethylolethylene urea and a curing agent for said urea to said bath, said urea being curable to form a viscous thermosetting resin, reacting said urea with said absorbed polysiloxane polymer at a temperature and for a time sufficient to permit a substantially uniform reaction throughout the fabric and thereafter subjecting said fabric to elevated temperature for a time sufficient to cure the reaction product.

3,871,910

EXTRUDED POLYPROPYLENE PRINT BANDS FOR POLYPROPYLENE LENO FABRIC

Edward Barkis, Marietta, and Ronnie Lee Sirmans, Lakeland, both of Ga., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 26, 1972, Ser. No. 318,529
Int. Cl. B44d *1/09*
U.S. Cl. 117—138.8 E **10 Claims**

1. A polyolefin fabric having integrally adhered to it, by extrusion without significant loss of fabric strength, a printable surface consisting of a polypropylene copolymer resin having a terminal block of copolymerized ethylene and propylene wherein the ethylene of said terminal block represents from 1.0 to 6.0 weight per cent of said propylene copolymer resin, a melt flow of 1.5 to 10.0 g/10 min, and a specific gravity of at least 0.865.

9. A process for making a polyolefin mesh fabric having integrally adhered to it, without significant loss of fabric strength, a printable surface involving the steps of extruding a polypropylene copolymer resin having a terminal block of copolymerized ethylene and propylene wherein the ethylene of said terminal block represents from 1.0 to 6.0 weight per cent of said propylene copolymer resin, a melt flow of 3.0 to 10.0 g/10 min, and a specific gravity of at least 0.865 onto a polyolefin mesh fabric while simultaneously removing heat energy from said polyolefin mesh fabric, pressing said extruded polypropylene copolymer partially into said polyolefin mesh fabric and then cooling said extruded polypropylene copolymer.

3,871,911

NON-DISCOLORING PAINTED POLYURETHANE

Philip Conacher, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 1, 1973, Ser. No. 365,978
Int. Cl. B44d *1/02*
U.S. Cl. 117—138.8 D **10 Claims**

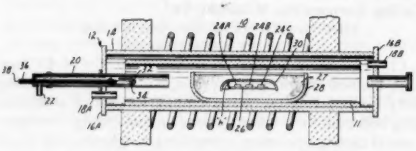
1. A process for preparing a substantially nondiscoloring painted polyurethane part which consists essentially of heat-curing an NCO-terminated polyurethane prepolymer with a complex of 4,4'-methylene dianiline and a salt, the salt being selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, sodium nitrite, lithium chloride, lithium bromide, lithium iodide, lithium nitrite, and sodium cyanide, the ratio of said dianiline to said salt in said complex being 3 moles to 1 mole, the proportions of prepolymer and complex being adjusted so that the NCO/NH_2 ratio is greater than one, thereby forming a polyurethane, and painting or coating said polyurethane with a flexible paint or coating.

3,871,912

PROCESS FOR PRODUCING A PARALLEL OVERGROWTH FOR USE AS AN EPITAXIAL THIN FILM LASER

Gunther H. Dierssen, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 887,650, Dec. 23, 1969, Pat. No. 3,730,764. This application Apr. 2, 1973, Ser. No. 347,236
Int. Cl. H01l *7/32*
U.S. Cl. 117—201 **12 Claims**



1. A vapor deposition process for the production of an epitaxial thin-film on a single crystalline substrate, wherein the resultant thin-film-substrate combination, when formed into a resonant cavity, is capable of laser emission, said process comprising the steps of:

a. selecting a combination of a single crystalline substrate material and source material wherein both said materials are compounds or solid solutions of at least one of the elements selected from the group consisting of cadmium and zinc, together with at least one of the elements selected from the group consisting of sulfur, selenium and tellurium, wherein crystals of both said materials have an interatomic spacing mismatch along at least one crystallographic axis of less than 12 percent, wherein said single crystalline substrate has at least one substantially flat growth surface crystallographically oriented so as not to correspond with a naturally occurring major face of a crystal of said source material and wherein said substrate has an optical band edge at least equal to the source material optical band edge;

b. providing a vacuum tight enclosure as a static reaction chamber;

c. positioning within said reaction chamber a bed of a predetermined quantity of sinter powder of said source material;

d. positioning said substrate on an inert spacer block and above said bed; and

e. heating said reaction chamber to a uniform predetermined temperature sufficient to enable sublimation of said source material and continuing heating to produce

said epitaxial thin-film of said source material on said substantially flat growth surface.

3,871,913
CLEANING OF DIALYSER COMPARTMENTS AND BLOOD LINES OF ARTIFICIAL KIDNEY MACHINE

Stanley Shaldon, London, England, assignor to Dialysis Systems Limited, London, England

Filed Feb. 13, 1973, Ser. No. 332,077
Claims priority, application Great Britain, Mar. 14, 1972, 11898/72
Int. Cl. B08b *9/02, 9/08*
U.S. Cl. 134—22 R **9 Claims**

1. A method of washing a blood dialyser of an artificial kidney machine of the type having a supply system which produces dialysate by mixing water with metered quantities of dialysate concentrate and heats and deaerates the resultant mixture, said dialyser having a blood compartment and a dialysate compartment, said method comprising the steps of:

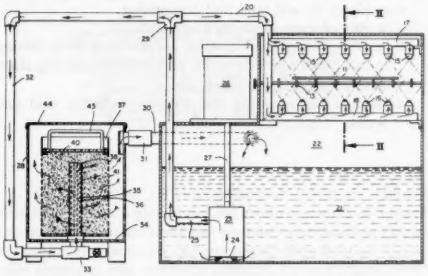
a. connecting the blood compartment of said dialyser to said dialysate supply system of said machine, and

b. using liquid from said supply system to wash both the blood and dialysate compartments of said dialyser.

3,871,914
ETCHANT RINSE APPARATUS

Daniel L. Goffredo, Riverton, N.J., and John Alfred Dunkelberger, Jr., Centre Hall, Pa., assignors to Chemcut Corporation, State College, Pa.

Filed Oct. 18, 1971, Ser. No. 190,136
Int. Cl. B08b *3/02, 3/10*
U.S. Cl. 134—109 **6 Claims**



1. A rinsing appartus for rinsing etching reactant from articles that have been etched by a reactant comprising a rinsing chamber, means for conveying etched articles through the chamber, rinse dispensing members located in said chamber and positioned for dispensing rinsing liquid onto the articles in the chamber, a rinse reservoir for containing a rinsing liquid, means for delivering rinsing liquid from said reservoir to said dispensing members, a replacement chamber having an inlet connected for receiving rinse liquid from said reservoir and having an outlet connected for recycling the rinse liquid for delivery to the reservoir, said replacement chamber including a tank containing a displacing material and means for facilitating flow of rinse liquid from the inlet through the displacing material in the tank and to the outlet, with the displacing material comprising means facilitating an ion replacement of etchant ions in the rinse liquid with ions from the displacing material, wherein said means for delivering rinsing liquid includes pump means for delivery of liquid simultaneously to both the rinse dispensing members and the replacement chamber.

3,871,915
HIGH ENERGY LITHIUM TYPE ELECTROCHEMICAL CELLS

Alfred Brych, Chasseneuil Du Poitou, France, assignor to Saft-Societe Des Accumulateurs Fixes Et De Traction, Ramainville, France

Filed Oct. 23, 1973, Ser. No. 408,290
Claims priority, application France, Oct. 30, 1972, 72.38412
Int. Cl. H01m *43/06*
U.S. Cl. 136—6 LN **8 Claims**

1. An electrochemical cell comprising a positive electrode containing a metal compound selected from the group consisting of a metallic chromate and a metallic oxide a negative electrode containing basically lithium and an electrolyte containing lithium perchlorate as solute and a solvent therefor, said solvent consisting of a mixture of a cyclic ether selected from the group consisting of tetrahydrofuran, dioxolane and propylene oxide and a non-saturated cyclic ester vinylene carbonate.

3,871,916
NONAQUEOUS CELL UTILIZING A 3ME20X-BASED ELECTROLYTE

Marvin L. Kronenberg, Cleveland Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

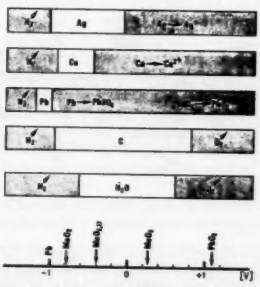
Filed Apr. 22, 1974, Ser. No. 462,792
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 LN **13 Claims**

1. A nonaqueous cell comprising a highly active metal anode, a solid $(CF_x)_n$ cathode wherein x is between about 0.5 and about 1.2, and a liquid organic electrolyte consisting essentially of 3-methyl-2-oxazolidone in combination with at least one low viscosity cosolvent and a conductive solute.

3,871,917
NEGATIVE ACTIVE SUBSTANCE FOR A STORAGE CELL

Jean-Paul Gabano, and Yves Jumel, both of Poitiers, France, assignors to Saft-Societe Des Accumulateurs Fixes Et De Traction, Romainville, France

Filed June 11, 1973, Ser. No. 368,866
Claims priority, application France, June 9, 1972, 72.20843; June 9, 1972, 72.20844; Nov. 23, 1972, 72.41702
Int. Cl. H01m *39/00*
U.S. Cl. 136—26 **30 Claims**



1. Storage cell comprising an acid electrolyte, a positive electrode constituted by the electrochemical system $PbO_2/H_2SO_4/PbSO_4$ and a negative electrode having active negative material that varies between the charged state and the discharged state in the form of oxides which are insoluble in the acid electrolyte, these oxides being selected from the group consisting of simple and mixed molybdenum oxides such that the average value of the valency of the oxide ranges from greater than or equal to four and less than or equal to six.

3,871,918
NEGATIVE ELECTRODE FOR ELECTROCHEMICAL GENERATOR

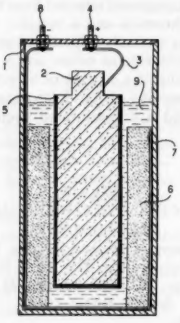
Claude Viescou, Epinay Sur Seine, France, assignor to Compagnie Industrielle Des Piles Electriques "Cipel", Levallois-Perret, France

Filed May 29, 1973, Ser. No. 364,273

Claims priority, application France, May 30, 1972, 72.19352

Int. Cl. H01m *43/00*

U.S. Cl. 136—30 **12 Claims**



1. Negative electrode for an electrochemical cell whose active material mainly consists of zinc powder in the form of a suspension in a gel, characterized in that the zinc particles are contained and retained in a three-dimensional gel and maintained therein in a stable space configuration, the three-dimensional gel being constituted by a polymerizing reaction product of acrylamide, acrylic acid and methylenebisacrylamide, said gel containing an electrolyte consisting of potassium hydroxide solution.

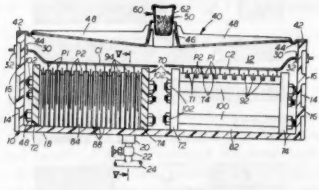
3,871,919
BATTERY PLATE FORMING APPARATUS

James H. Barrett, Jr., 3863 Surrey Rd., Toledo, Ohio 43615

Filed Sept. 24, 1969, Ser. No. 860,620

Int. Cl. H01m *35/18*

U.S. Cl. 136—82 **2 Claims**



1. In a series of battery plate forming boxes for transforming lead sulfate paste used in filling the lead grids of the negative and positive plates into spongy lead and lead peroxide, respectively, each box being independent of each other and each having its own electrolyte and separate non-corrosive plastic rack for supporting plates to be formed with their longer sides horizontal for easy viewing, each said box comprising:

A. a shallow open non-corrosive plastic tank having an upper peripheral horizontal edge, vertical side walls and a flat horizontal bottom, and at least one aperture below said edge in a side wall for an electrical conductor connected to the plates to be formed, and having a normally closed drain in said bottom,

B. means for sealing the conductor in said aperture,

C. a removable non-corrosive plastic cover for the top of said tank having a peripheral flange resting on said peripheral edge, a depending peripheral ridge inside said flange adjacent said side walls, an under surface which slopes downwardly and inwardly from said peripheral edge to an aperture, which surface directs condensate away from the edges of said cover to drip back into the tank,

D. a replaceable filter means in said aperture in said cover to permit gases generated in said tank to escape but to condense and retain acid vapors, and

E. a spigot above each tank for filling it with liquid;

said rack being adjustable for supporting the battery plates in said tank, said rack comprising:

a. a pair of vertical parallel side walls,

b. a pair of vertically slotted parallel end walls having ends against said side walls, said end walls having alternately notched top edges, and

c. means for adjusting the distance between said end walls.

2. In a series of battery plate forming boxes, each box being independent of each other and each having its own electrolyte and separate rack for supporting plates to be formed, each said box comprising:

A. an open top tank having at least one aperture in its side for an electrical conductor connected to the battery plates to be formed,

B. means for sealing said conductor in said aperture,

C. a removable cover for the top having

a. a filter vent therein, and

b. means on the lower side of said cover extending below the peripheral edge of said cover for directing condensate away from said edges of said cover to drip toward the center portion of said tank; and

D. each said rack being adjustable for supporting the battery plates in said tank and comprising:

a. a pair of vertical parallel side walls,

b. a pair of vertically slotted parallel end walls having ends against said side walls, said end walls having alternately notched top edges, and

c. means for adjusting the distance between said end walls.

3,871,920
AIR DEPOLARIZED CELL

Gerard Grebier, Biard-Poitiers, and Pierre Arlot, Chasseneuil, both of France, assignors to Saft-Societe Des Accumulateurs Fixes Et De Traction, Romainville, France

Filed Apr. 24, 1973, Ser. No. 353,992

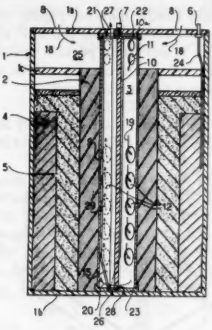
Claims priority, application France, Aug. 25, 1972, 72.30383

Int. Cl. H01m *29/04*

U.S. Cl. 136—86 A **12 Claims**

1. Air depolarization cell comprising a negative electrode having a zinc base, an electrolyte, and a positive electrode, means for supplying circulating air to said positive electrode comprising a flue in the said positive electrode, in communication with the outside air at its upper portion, a tubular conductive collector lining said flue in its length and extending outwardly of said upper portion, partitioning means of a length substantially equal to the length of said collector positioned within said collector and defining at least two longitudinal chambers of different volumes therein communicating at their lower portions and the said collector having perforations in each of said chambers exposing catalytic sites of said positive

electrode in said flue to air, the proportionality coefficients of the air input surfaces at the catalytic sites of said positive

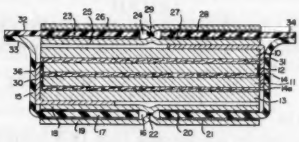


electrode via said perforations with respect to the corresponding volumes of the respective chambers being different.

3,871,921
FLAT ALKALINE CELL CONSTRUCTION AND METHOD FOR ASSEMBLING THE SAME

Theodore R. Beatty, Bay Village, and Harry Vourlis, Lakewood, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,838
Int. Cl. H01m *21/00*
U.S. Cl. 136—111 **29 Claims**



1. A flat alkaline cell comprising an electrode assembly including at least a pair of flat electrode elements of opposite polarity and a porous separator containing an alkaline electrolyte interposed between and in contact with the pair of electrode elements, said electrode assembly being enclosed within a sealed, liquid impervious plastic film envelope having an opening in one wall thereof, a flat internal current collector member disposed adjacent to the inner side of said wall and overlying said opening, a flat external current collector member disposed adjacent to the outer side of said wall and overlying said opening, said internal and external current collector members being tightly adhered to the inner and outer sides of said wall by means of thin layers of an adhesive sealant which is non-wettable by the alkaline electrolyte, said flat internal current collector being in electrical connection with one of said flat electrode elements and means for making electrical connection between said internal and external current collector members through said opening in said wall.

22. The method of assembling a flat alkaline cell including an electrode assembly comprising at least a pair of flat electrode elements of opposite polarity and a porous separator containing an alkaline electrolyte interposed therebetween, said method comprising the steps of providing at least two plastic film wall members for forming a sealed envelope for said cell, at least one of said wall members having an opening therein, placing a flat internal and a flat external current collector adjacent to the inner and outer sides of said one wall member overlying said opening therein, applying a thin layer of adhesive sealant which is non-wettable by the alkaline electrolyte on the surface of at least one of said internal and external current collectors and said one wall member, tightly adhering said current collectors to the respective inner and outer sides of said one wall member by means of said thin layer of adhesive sealant, electrically connecting said internal and external current collectors through said opening in said one wall member, placing the so-formed composite collector-wall member adjacent to one end of said electrode assembly with said internal current collector making electrical connection with one of said flat electrode elements, and then completing the assembly of said sealed envelope by placing the other of said wall members adjacent to the other end of said electrode assembly and then sealing together the marginal borders of said wall members.

3,871,922
GAS DIFFUSION ELECTRODE FOR ELECTROCHEMICAL CELLS

Harald Bohm, Oberursel, and Jochen Heffler, Grossauheim, both of Germany, assignors to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Germany

Filed July 12, 1972, Ser. No. 271,157
Claims priority, application Germany, July 12, 1971, 2134704; July 12, 1971, 7126690
Int. Cl. H01m *35/00*
U.S. Cl. 136—120 FC **9 Claims**

1. A gas diffusion electrode for an electrochemical cell having a acidic electrolyte and in which cell the gas diffusion electrode contacts an abutting electrode comprising:

a. a metal net;

b. a corrosion resistant, electrolyte-and gas-impervious, graphite foam coating encasing said net, said foam coating having a frame having on one side two spaced apart, lateral extensions;

c. a porous catalyzing layer having a first side defining one side of a gas chamber, a second side defining one side of an electrolyte chamber, a top wall and a bottom wall, with said graphite foam coating being in contact with said layer along said first side and the extensions of said coating being in contact with the top and bottom walls of the catalyst layer and extending past the second side of said catalyst layer;

d. a main electrolyte inlet canal passing through said frame;

e. a main electrolyte outlet canal passing through said frame;

f. sunken canal means on one of said two spaced apart lateral extensions of the frame of the graphite foam coating for conducting electrolyte from the main inlet electrolyte canal to the electrolyte chamber defined by said second side of said catalyst layer;

g. sunken canal means on the other of said two spaced apart lateral extensions of the frame of the graphite coating for conducting electrolyte from the electrolyte chamber defined by said second side of said catalyst layer to the main outlet electrolyte canal; and

h. an electrically insulating coating on said frame of the graphite-foam coating for preventing electrical contact between the electrolyte and the graphite coating and for

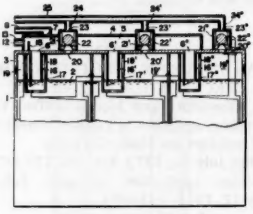
preventing electrical contact between the electrode and an abutting electrode.

3,871,923

STORAGE BATTERY

Seiichiro Ikeda, Takatsuki, Japan, assignor to Yuasa Battery Company Limited, Takatsuki, Japan

Filed Nov. 16, 1973, Ser. No. 416,498
Claims priority, application Japan, Dec. 14, 1972, 47-125424
Int. Cl. H01m *7/02*
U.S. Cl. 136—162 **7 Claims**



1. A storage battery adapted to be supplied with air from an air source and water from a water supply tank, the battery comprising:

a monoblock battery container having a plurality of storage cells arranged therein and a lid covering said cells, said lid being provided with liquid supplying means for use in supplying air and water to said cells and gas exhausting means for use in exhausting oxygen and hydrogen produced in said cells from said cells;

said liquid supplying means including a slender section provided within said lid;

a plurality of electrolyte level setting tubes arranged in communication with said slender section each extending in a downward direction from the back of said lid into a respective one of said cells;

a plurality of gas passageways, each arranged in communication with a respective one of said cells;

said gas exhausting means including a plurality of valves, each arranged within a respective gas passageway;

means adapted for supplying air from the air source into each of said cells through said liquid supplying means and said electrolyte level setting tubes and causing an exhaust flow of oxygen and hydrogen gas from within said cells to escape through said gas exhausting means into the atmosphere;

means adapted for discontinuing the flow of air into said cell and the exhaust of the exhaust gases and subsequently to feed water from the water supply tank into each of said cells through said liquid supplying means and said electrolyte level setting tubes; and,

means adapted for supplying air from the air source into said gas exhausting means so as to cause the closure of said valves when water is being supplied to said cells.

3,871,924

BATTERY HOUSING WITH HANDLE FOR STACKING

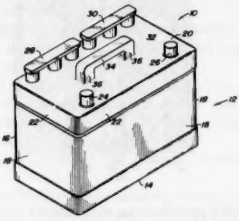
David A. DeMattie, 18110 Carol Dr., Strongsville, Ohio 44136, and Anthony Fago, 4473 W. 137th St., Cleveland, Ohio 44135

Filed May 25, 1973, Ser. No. 363,890
Int. Cl. H01m *1/02, 1/04*
U.S. Cl. 136—166 **5 Claims**

1. An improved battery casing for automotive-type wet cell storage batteries comprising a generally rectangular molded housing including a bottom wall, vertically extending side and end walls, and a generally horizontal top wall;

at least a pair of terminal posts spaced on said top wall and extending upwardly therefrom and terminating in upper top surfaces;

at least one rigid handle member rigidly connected to and extending outwardly from said top wall, said handle member having an upper body portion spaced from the top wall to define a finger-receiving recess, said upper body portion having a top surface; and,



said handle and said terminal posts being located such that their top surfaces define at least three nonaligned support surfaces spaced apart and defining a plane parallel with the bottom wall of said casing and the bottom wall of a second battery casing to form means for engaging the bottom wall of said second battery casing of similar configuration rested in alignment thereon to be supported on the tops of the handle and the terminal posts with substantial stability.

3,871,925

METHOD OF CONDITIONING 18–8 STAINLESS STEEL

John Nunes, Libertyville, Ill., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 29, 1972, Ser. No. 310,222
Int. Cl. C22c *39/20;* **C21d** *7/14*
U.S. Cl. 148—12 E **6 Claims**

1. A process for conditioning Type 18–8 stainless steel for subsequent cold deforming comprising the steps of:

a. annealing the material in a temperature range of from about 1,500°F to about 2,100°F; and,

b. mechanically deforming the material not more than approximately 85% at a temperature of from 150°F above the M_{d30} temperature, thereby

c. decreasing the ambient temperature stability of the austenite wherein it forms martensite at a rapid rate upon being cold worked.

3,871,926

PROCESS FOR PRODUCING A COMPOSITE METALLIC ARTICLE

James Q. Steigelman, Athens, Pa., assignor to W. M. Chace Company, Detroit, Mich.

Continuation of Ser. No. 303,195, Nov. 2, 1972, abandoned, which is a division of Ser. No. 138,779, April 29, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 439,221
Int. Cl. B23p *3/10*
U.S. Cl. 148—12 E **8 Claims**

1. A process for producing a strip of laminated material comprising:

a. heating a relatively thick layer of a stainless steel alloy to a first temperature sufficient to solution treat the stainless steel alloy,

b. cooling said alloy to a second temperature from about 50°F to about 200°F below said first temperature,

c. applying a layer of a brazing alloy to one surface of said stainless steel to achieve a bond along a common interface,

d. cooling the resulting laminate to a third temperature below about 900°F and above the martensitic transformation temperature,
e. reducing the thickness of the laminate while at said third temperature to produce a strip and
f. cooling said strip to ambient temperature.

3,871,927

PROCESS FOR PRODUCING A HIGH-PERMEABILITY ALLOY FOR MAGNETIC RECORDING-REPRODUCING HEADS

Hakaru Masumoto, Sendai City; Yuetsu Murakami, Izumi-Machi, and Masakatsu Hinai, Natori City, all of Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Sendai City, Japan

Division of Ser. No. 290,424, Sept. 19, 1972, Pat. No. 3,794,530. This application July 20, 1973, Ser. No. 381,134
Claims priority, application Japan, Oct. 13, 1971, 46-80207
Int. Cl. H01f *1/00*
U.S. Cl. 148—121 **4 Claims**

1. A method of manufacturing a high permeability and high hardness alloy for use for magnetic recording and reproducing heads comprising, melting an alloy consisting of 60.2 to 85.0 Wt. % of nickel, 6.0 to 30.0 Wt. % of iron and 3.1 to 23.0 Wt. % of tantalum as the main ingredient, and further consisting of the total amount of 0.01 to 10.0 Wt. % of at least one element selected from the group consisting of 0 to 7 Wt. % of molybdenum, 0 to 5.0 Wt. % of chromium, 0 to 10.0 Wt. % of tungsten, 0 to 7.0 Wt. % of vanadium, 0 to 3.1 Wt. % of niobium, 0 to 10.0 Wt. % of manganese, 0 to 7.0 Wt. % of germanium, 0 to 5.0 Wt. % of titanium, 0 to 5.0 Wt. % of zirconium, 0 to 5.0 Wt. % of aluminum, 0 to 5.0 Wt. % of silicon, 0 to 5.0 Wt. % of tin, 0 to 5.0 Wt. % of antimony, 0 to 10.0 Wt. % of cobalt, and 0 to 10.0 Wt. % of copper as the subingredient, and an inevitable amount of impurities so as to form an alloy having a homogenized solid solution structure, heating at a temperature of more than 800°C, in a non-oxidizing atmosphere or in vacuo, for at least more than 1 minute but not longer than 100 hours depending upon the composition, and cooling from a temperature of more than the order-disorder transformation point of about 600°C to a room temperature at a suitable speed depending upon the composition so as to provide the degree of order of 0.1 to 0.6, the Vickers hardness of more than 150, initial permeability of more than 3,000 and maximum permeability of more than 5,000.

3,871,928

HEAT TREATMENT OF NICKEL ALLOYS

Darrell Franklin Smith, Jr., and Edward Frederick Clatworthy, both of Huntington, W. Va., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Aug. 13, 1973, Ser. No. 387,944
Int. Cl. C22c *41/02*; **C22f** *1/10*; **C22c** *39/20*
U.S. Cl. 148—142 **8 Claims**

1. A process of heat treating an age-hardenable heat-resistant nickel alloy consisting essentially of at least about 25% nickel and up to 60% iron, with a total of at least 50% nickel-plus-iron, and precipitable amounts of gamma-prime forming metal selected from the group consisting of up to 6.5% columbium, up to 5% titanium and up to 6% tantalum and mixtures thereof with a total of at least 2% columbium-plus-titanium-plus-½ tantalum up to 6.5% aluminum, the total of the columbium content plus the titanium content plus the aluminum content plus one-half the tantalum content does not exceed 10%, up to 2% vanadium, up to 25% chromium, up to 30% cobalt, up to 10% molybdenum, tungsten or mixtures thereof, up to 0.2% boron, up to 0.2% zirconium and up to 0.2% carbon and characterized by a solidus temperature of at least about 2,300°F., a gamma-prime solvus temperature of at least 1600°F. and a gamma-prime precipitation temperature of at least 1100° F. comprising:
a. heating the alloy at a temperature of about 1,600 to 1,950°F and gamma-prime solid solution range of the alloy and obtaining the alloy in the solid solution condition having precipitable amounts of the gamma-prime forming metal in solid solution; b. cooling the alloy from the solid solution temperature down to the gamma-prime solvus temperature;
c. then slowly cooling the alloy uniformly at a controlled cooling rate of at least about 20°F. per hour and not greater than 500°F. per hour from the gamma-prime solvus temperature down to about 1,100°F or lower;
d. heat treating the slow-cooled alloy at an upper temperature in the precipitation range to precipitate coarse patches of gamma-prime in the vicinity of the grain bounderies of the alloy and dispersed uniformly within the grains while retaining a portion of the gamma-prime forming metal in solution;
e. thereafter heat treating the alloy at a lower temperature in the precipitation hardening range to precipitate fine particles of gamma-prime dispersed uniformly within the grains; and
f. then cooling the alloy to room temperature, to thereby provide the alloy in the heat treated condition characterized by having coarse gamma-prime particles at least twice the size of the fine gamma-prime particles.

3,871,929

POLYMERIC ETCH RESIST STRIPPERS AND METHOD OF USING SAME

William R. Schevey, Hawley, Pa., and Frank J. Kremers, Jordan, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 30, 1974, Ser. No. 438,127
Int. Cl. C23g *1/02*; **C09k** *3/00*
U.S. Cl. 156—2 **17 Claims**

1. A stripper for polymeric organic substances which stripper comprises from about 25 to about 35 weight percent phenol or acetic acid, from about 10 to about 30 weight percent phenol sulfonic acid, from about 15 to about 30 weight percent of a chlorinated hydrocarbon which boils between about 120 to about 210° Centigrade, from about 25 to 35 weight percent of a suitable surface active agent having a HLB number of between about 11.0 and 12.5.

3,871,930

METHOD OF ETCHING FILMS MADE OF POLYIMIDE BASED POLYMERS

John G. Fish, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 19, 1973, Ser. No. 426,275
Int. Cl. H05k *3/06*
U.S. Cl. 156—3 **11 Claims**

1. A process for etching a film of a polyimide based polymer which comprises contacting said film with a solution of a strong organic base in a non-aqueous solvent selected from the group consisting of dimethylsulfoxide, sulfolane, dimethylformamide, hexamethylphosphoramide, N-methyl pyrrolidone, N, N-dimethylacetamide, N, N-diethylformamide; N, N-diethylacetamide, and pyridine.

3,871,931

METHOD FOR SELECTIVELY ETCHING SILICON NITRIDE

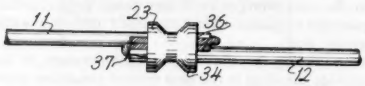
Geoffrey Allan Godber, Roade, Northampton, United Kingdom, assignor to Plessey Incorporated, New York, N.Y.

Filed Jan. 17, 1974, Ser. No. 434,109
Claims priority, application United Kingdom, July 18, 1973, 34213/73
Int. Cl. C23g *1/00*
U.S. Cl. 156—7 **9 Claims**

1. A method of selectively etching silicon nitride comprising:

providing an etch solution of arsenic acid;
heating said etch solution to an elevated temperature; and
exposing selected areas of said silicon nitride to the heated etch solution.

3,871,932
METHOD OF CONNECTING INSULATED CONDUCTORS
Earl G. Langenberg, New York, N.Y., assignor to The Anaconda Company, New York, N.Y.
Filed Mar. 2, 1973, Ser. No. 337,350
Int. Cl. H01r *5/08;* **B21f** *15/02*
U.S. Cl. 156—49 **4 Claims**

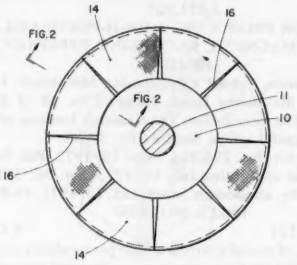


1. The method of splicing together first and second insulated conductors, each comprising a metallic strand and a tubular wall of insulation surrounding said strand, said wall having an outer peripheral surface, comprising the steps of:
A. stripping lengths of said walls of insulation from the ends of each of said insulated conductors, thereby forming newly cut end faces in each of said walls and exposing end lengths of each of said strands,
B. folding back each of said end lengths against said surface of the wall of insulation of its respective insulated conductor,
C. overlaying the ends of said insulated conductors so that a substantial section of the folded back end length of the strand of one insulated conductor is coextensive with a substantial section of the folded-back end length of the other insulated conductor,
D. fitting a metal ferrule around said first and second insulated conductors and both of the folded-back exposed strands while leaving both a substantial insulated portion and a substantial exposed strand portion of each insulated conductor projecting from each end of said ferrule,
E. crimping said ferrule down upon both exposed end lengths of said insulated conductors and said surfaces so as to provide flared openings of said ferrule at both ends thereof, thereby holding said conductors firmly against separation.

3,871,933
PROCESS FOR THE INDUSTRIAL MANUFACTURE OF FABRICS, STRIPS OR RIBBONS AND THE SO MANUFACTURED PRODUCTS
Jean De Brabander, Hamme-Durme, Belgium, assignor to Velcro S.A., Cesar-Soulie, Switzerland
Filed Feb. 16, 1970, Ser. No. 11,863
Int. Cl. D03d *47/50*
U.S. Cl. 156—88 **1 Claim**

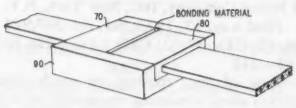
1. A process of producing ribbons from a relatively large sheet of fabric susceptible to raveling when cut and consisting of a structure with interstices covered by piles made of a thermoplastic material, said process comprising the steps of heating the piles of surfaces intended to form marginal edges of said ribbons to a temperature at which said piles are in a softened state and pressing the thus softened piles in the interstices of said structure.

3,871,934
RESURFACING BRAKE DISCS
Glenn R. Marin, Ransomville, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.
Filed June 28, 1973, Ser. No. 374,742
Int. Cl. B32b *31/12, 31/18, 35/00*
U.S. Cl. 156—94 **6 Claims**



1. A method for applying a friction surface to a carbonaceous brake disc, the disc having at least one periphery and including at least one wearing surface, the method comprising:
a. applying to said periphery a flexible tape of sufficient length to circumvent the periphery of the disc at least once, the tape having sufficient width to cover the periphery and to provide sufficient tape overlap to cover at least one wearing surface of the disc;
b. cutting the tape overlap on at least one side of the disc in at least one place;
c. folding and pressing the tape overlap against the wearing surface of the disc;
d. impregnating the tape with a curable carbonizable resin; and
e. curing and carbonizing the resin to form the friction surface.

3,871,935
METHOD OF ENCAPSULATING AND TERMINATING THE FIBERS OF AN OPTICAL FIBER RIBBON
Detlef Christoph Gloge, Red Bank, and Peter William Smith, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 14, 1974, Ser. No. 451,217
Int. Cl. B65h *69/02*
U.S. Cl. 156—158 **5 Claims**



1. A method of encapsulating and terminating an optical fiber ribbon comprising a plurality of optical fibers embedded in a common protective jacket including the steps of:
dissolving the protective jacket along a portion of said ribbon thereby exposing the plurality of individual fibers;
placing the fibers thus exposed in a mold which aligns said fibers in a predefined manner relative to each other;
adding an encapsulating material to said mold thereby encapsulating the fibers located therein in said predefined manner;
and dividing said encapsulated fibers into two parts thereby exposing the transverse surfaces of said fibers.

3,871,936

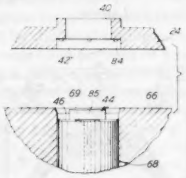
LOADING OF COMPLIANT TAPE

John A. Boyer, Allentown; David P. Ludwig, and Friedrich Zwickel, both of Whitehall, all of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 185,648, Oct. 1, 1971,. This application Aug. 24, 1973, Ser. No. 391,435

Int. Cl. B65d 85/00

U.S. Cl. 156—238 3 Claims



3. A method of handling beam-lead semiconductor devices which comprises the steps of:

aligning the devices to cavities formed in a tape, the beam-leads of the devices extending over the periphery of the cavities to align with pocket-like depressions in the tape located about each of the cavities;

adhesively securing beam leads of the devices to the pocket-like depressions, thereby suspending the devices in the cavities; and

reeling the loaded tape to provide a compact and damage-preventing package, said cavities and depressions forming protective barriers for the devices and their beam-leads in the reeled package.

3,871,937

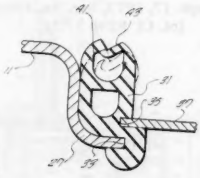
METHOD OF FORMING A GASKET

Robert A. Hollingsead, Yorba Linda, and Clyde Robert Pryor, Anaheim, both of Calif., assignors to Hollingsead-Pryor Enterprises, Inc., Santa Fe Springs, Calif.

Division of Ser. No. 125,561, March 18, 1971, Pat. No. 3,771,023. This application Sept. 24, 1973, Ser. No. 399,691

Int. Cl. B29d 27/00

U.S. Cl. 156—244 5 Claims



1. A method of forming a gasket for use in an avionic tray having an apertured rim and a removable metering plate, comprising the steps of:

extruding an elongated flexible material to form a gasket member which defines first and second generally parallel grooves on opposite sides of the gasket member, a passageway disposed above the grooves and a sealing surface formed along the top of the gasket member and above the passageway;

cutting the extruded gasket member to a predetermined length, and

bonding the two ends of the gasket together to form an annular gasket, the gasket maintaining a flat sealing surface when the gasket is deformed into an oblong shape.

3,871,938

PROCESS OF MAKING LEATHER LIKE SHEET MATERIAL

Takemitsu Takahasi, Tokyo; Keigi Yamazaki, Omiya, and Hirosi Tanaka, Urawa, all of Japan, assignors to Fuji Spinning Co., Ltd., Tokyo, Japan

Filed July 6, 1972, Ser. No. 269,381

Claims priority, application Japan, Nov. 27, 1971, 46-94890

Int. Cl. B32b 27/40

U.S. Cl. 156—246 10 Claims

1. A process for preparing a leather-like sheet of material which comprises:

a. applying a polyurethane polymer to a supporting base;

b. coagulating said polymer solution to form a porous structure which constitutes a first coagulated polymer layer (I) by immersing the supporting base and layer in a non-solvent for said polymer such that at least a portion of said non-solvent is retained in the pores of said layer;

c. applying a second layer of a polyurethane polymer solution onto said first coagulated layer (I), whereby the non-solvent which is retained in the pores of said first layer acts to coagulate the second layer at the interface between said layers;

d. applying a fibrous substrate to said second layer to form a composite;

e. coagulating said second layer by immersing the composite in a non-solvent for the polymer to form a second coagulated polymer layer (II);

f. peeling the resulting composite which consists of said first coagulated layer (I), said second coagulated layer (II), and said fibrous substrate, from its supporting base to yield the product; and

g. removing the solvent from the resulting product by washing with water and drying.

3,871,939

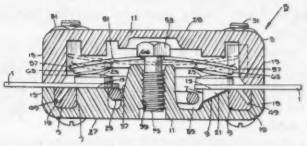
PROCESS FOR MOUNTING TERMINAL MEANS

Lee O. Woods, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 290,574, Sept. 20, 1972. This application Oct. 23, 1973, Ser. No. 408,868

Int. Cl. B32b 31/00; H01r 9/16

U.S. Cl. 156—293 12 Claims



1. A process of mounting a metallic terminal to a generally hollow dielectric housing of an electrical device with electrical components thereof predeterminately disposed within the housing, the housing having a wall with a terminal receiving aperture therethrough and a step raised from an interior floor of the housing with the top of the step extending to the wall adjacent the aperture, the step having a generally planar terminal support surface and a recess in the top of the step between the support surface and the wall, a conduit in the housing between the recess and the housing floor, the terminal having a generally planar surface adapted to be secured atop the terminal support surface, and a tab projecting from the terminal surface, said process comprising the steps of:

a. coating at least a portion of the terminal surface with a thermosetting adhesive;

b. placing the coated terminal surface upon the support surface therefor and extending the tab into the recess;

c. flowing at least a portion of the adhesive from the coated terminal surface toward the aperture into the recess onto

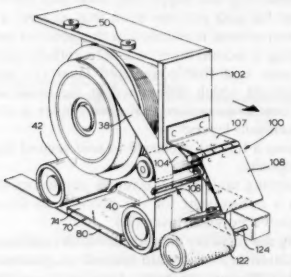
the tab therein and directing excess adhesive into the conduit; and

d. collecting the flow of excess adhesive through the conduit upon the floor of the housing at a location therein predeterminately spaced from the electrical components.

3,871,940
TAPE DISPENSER

Rinaldo Antonioni, Chelmsford, Ontario, Canada, assignor to Andrew A. Hatala, Saint Catharines, Ontario, Canada, a part interest

Filed Nov. 12, 1973, Ser. No. 414,931
Int. Cl. B26d *5/00;* **B32b** *31/00;* **B44c** *7/00*
U.S. Cl. 156—353 **10 Claims**



1. A tape dispenser applicator for dispensing and applying a tape to a ledge projecting outwardly from a substantially planar surface comprising:

a. a body having an upper end and a lower end,

b. a body having means for mounting a tape spool for unwinding rotation thereon with an edge of the spool disposed in an exposed outwardly directed first plane at one side of said body,

c. said body having applicator roller means for guiding and unwinding a tape in an application path with the outer edge of the unwinding tape disposed in said first plane, said applicator guide roller means including at least one applicator roller located at the lower end of said body for receiving and unwinding tape and applying the tape to a ledge in use,

d. spacer means located a substantial distance above the lower end of said body for spacing said first plane outwardly from said planar surface whereby said tape is free to unwind without frictional interference from said planar surface, and

e. pressure plate means mounted on said body rearwardly of said applicator roller for movement with respect to said body toward and away from said ledge to apply a pressure to a portion of an unwinding tape downstream of and adjacent said first applicator roller.

3,871,941
APPARATUS USED IN BONDING A PRECURED TREAD ON A TIRE CASING

Elmer J. Wasko, Wadsworth, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

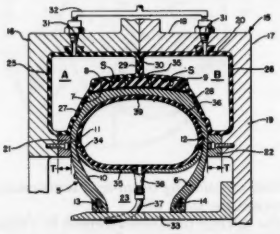
Filed Feb. 14, 1972, Ser. No. 225,781
Int. Cl. B29h *5/04*
U.S. Cl. 156—394 **24 Claims**

1. A mold-like apparatus in which a tire casing with a precured tread is placed for heating and curing an adhesive for bonding the precured tread to the tire casing, comprising in combination:

a. a pair of rigid sections movable relative to each other and, when closed in abutting relation, forming a cavity for receiving a tire casing with a precured tread, each of the sections including a closure plate secured to an outstanding cylindrical casing extending from the plate;

b. a single, rigid, annular stop projecting from each of the sections into the cavity for substantially closing the space between the sections and adjacent sidewalls of a tire in said cavity, the stops being in radially spaced relation from the outstanding cylindrical casings to effect an annular seal with the sidewalls in spaced relation from the juncture of the precured tread and tire casing;

c. a pair of separate, non-communicating, annular chambers for receiving steam, disposed in the sections between the cylindrical casings and stops;



d. a pair of annular, flexible elastomeric diaphragms sealing the steam chambers from the tire cavity formed by the sections, the diaphragms designed to, (I) cover the precured tread and juncture and prevent steam from contacting the tread and juncture, and (II) compress the precured tread against the tire casing when the chambers are filled with steam sufficient to move the diaphragms into contact with the precured tread and juncture;

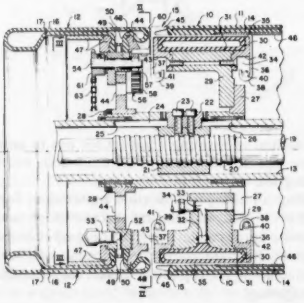
e. means for uniformly filling the chambers with steam; and

f. means for selectively, detachably mounting a plurality of stops with different thicknesses (T) on the closure plates.

3,871,942
PNEUMATIC TIRE CARCASS BUILDING MACHINE HAVING A BEAD LOCK ASSEMBLY AND A METHOD OF USING THE SAME

Virgil E. Henley, and Steve Kovalchik, Jr., both of Akron, Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Sept. 17, 1973, Ser. No. 398,052
Int. Cl. B29h *17/22*
U.S. Cl. 156—400 **1 Claim**



1. A pneumatic tire carcass building machine comprising:

A. a cylindrical drum rotatably mounted on a shaft, said drum adapted for building thereon a tire carcass of rubberized fabric plies;

B. shoulder forming means for forming bead ring receiving shoulders at each side of a rubberized fabric ply disposed on said cylindrical drum;

C. bead setting means for abutting bead rings with bead ring receiving shoulders at each side of a said ply formed by said shoulder forming means disposed exteriorly of said cylindrical drum;

D. turnover means for wrapping edge portions of a said ply disposed on said cylindrical drum about the bead rings abutted by the bead setting means disposed exteriorly of said cylindrical drum; and

E. bead lock means for concentrically positioning the bead rings abutted by the bead setting means while said turnover means wrap edge portions of a said ply disposed on said cylindrical drum around the bead rings to form the bead ring portions of the tire carcass each said bead lock including

i. at least three bead clamps spaced radially about the shaft of the cylindrical drum to concentrically position, when in preset extended positions, the bead rings while the turnover means wrap said edge portions of a said ply around said bead rings; and

ii. drive means for simultaneously moving said bead clamps from retracted positions to said preset extended positions said drive means including

a. a rack and pinion means at each bead clamp with the rack rigidly fastened to the bead clamp,

b. a power train transmission means at each bead clamp fastened to the pinion of said rack and pinion means, and

c. a hydraulic means to drive said train transmission means and in turn move said bead clamps radially between said retracted positions and said extended positions.

3,871,943

BOTTLE LABELING MACHINE

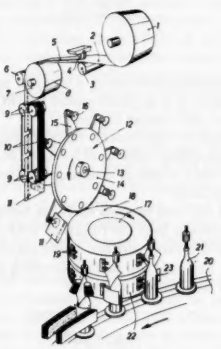
Rudolf Zodrow, Lichtstr. 37, 4 Dusseldorf, Germany

Filed Nov. 28, 1972, Ser. No. 310,044

Claims priority, application Germany, Dec. 4, 1971, 2160212

Int. Cl. B65c *9/14, 9/18*

U.S. Cl. 156—521 **1 Claim**



1. In a container labelling machine including a roll of wrapping elements, means for dividing said roll into individual wrapping elements lying in a common plane, means for receiving and applying said individual wrapping elements, and means for conveying containers past said receiving and applying means whereby a wrapping element is applied to each container, the improvement wherein said receiving and applying means includes (a) a plurality of members for gripping respective wrapping elements, each gripping member including a suction member with all of said suction members lying in the common plane of said divided individual wrapping elements, (b) means for rotating said plurality of gripping members continuously about a first axis, (c) means for rotating each of said gripping members about a second axis parallel to but spaced from said first axis after each of said gripping members has gripped its wrapping element, thereby to cause said wrapping element to rotate simultaneously about the first axis and the axis of said gripping member and to change its orientation in its own plane so as to establish a predetermined orientation relative to said containers, the extent of rotation about said second axis determining such orientation, and (d) a rotatable transfer member for bringing said oriented element to a location where said element is picked up by a container as it is moved by said container conveying means, the axis about which said transfer member rotates being perpendicular to said first axis.

3,871,944

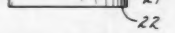
INTEGRAL COMPOSITE ELEMENT USEFUL IN ELECTROSTATIC CLUTCH OR BRAKE DEVICES

Mario Dominguez-Burguette, North Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed June 11, 1973, Ser. No. 368,718

Int. Cl. B32b *1/04;* **F16d** *37/02;* **B32b** *5/16;* **F16d** *69/00;* **B32b** *19/02;* **B60l** *7/10*

U.S. Cl. 161—42 **8 Claims**



1. An integral composite element having a highly electrically conductive surface and a semiconductive surface, said element being especially suited for use in electrostatic brake or clutch devices, comprising a first layer of bonded particulate semiconductive material and a second layer of bonded particulate highly conductive metal, said metal being solid at room temperature and capable of prolonged exposure to an ambient atmosphere without appreciable reduction in electrical conductance, said particulate semiconductive material and said particulate metal being bonded together with a quantity of thermoset resin sufficient to provide an integral, self-supporting, handleable, rigid article but not sufficient to electrically isolate either the metal particles or the semiconductive particles in their respective layers and at the interface between the layers.

3,871,945

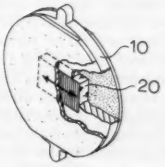
MAGNETICALLY ACTUABLE ELEMENT

Donald Winrow, Weston, Ontario, and Charles Norman Smith, Mississauga, Ontario, both of Canada, assignors to Ferranti-Packard Limited, Toronto, Ontario, Canada

Filed Mar. 12, 1973, Ser. No. 340,109

Int. Cl. B32b *1/04*

U.S. Cl. 161—44 **3 Claims**



1. A plurality of tape layers arranged so that a plurality of

magnetically rotatable thin flat members may be formed therefrom comprising:

three laminated layers of tape extending longitudinally together,

with adjacent layers arranged to adhere to each other,

both said outer tapes being set back from at least one edge of said middle tape,

a series of magnet apertures in said middle tape spaced longitudinally therealong, and located in that portion of said tape covered on each side by said outer tapes,

magnets in said apertures magnetizable at a predetermined angle relative to the longitudinal extension direction of the tape,

a series of cut-out locations in said middle tape, spaced longitudinally therealong and located in that portion of said middle tape, which is exposed on each side, by the set-back of said outer tapes,

said cut-out locations being so arranged that each magnet aperture is a predetermined bearing and distance from one of said cut-out locations.

3,871,946

NOVEL HIGH TEMPERATURE RESISTANT FABRICS

Eric R. Romanski, Delmar; J. Drew Horn, Kinderhook, and William H. Dutt, Rensselaer, all of N.Y., assignors to Albany International Corporation, Albany, N.Y.

Filed Nov. 30, 1973, Ser. No. 420,431
Int. Cl. B32b *5/02*; **D03d** *19/00*
U.S. Cl. 161—88 **11 Claims**

1. A high temperature resistant open weave fabric which comprises:

in a leno weave,

i. warp yarns comprising a high temperature resistant polyamide fiber and

ii. crossover yarns which comprise a high temperature resistant polyamide fiber braided over a core selected from glass fiber, metal wire and mixtures thereof;

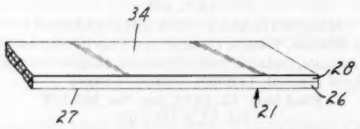
said wrap yarns and said crossover yarns of said weave being coated with a high temperature resistant resin selected from polyamides, polyimides, polyamideimides and mixtures thereof.

3,871,947

BIAXIALLY ORIENTED POLYETHYLENE TEREPHTHALATE FILM HAVING A SURFACE SUITABLE FOR WRITING THEREON

Roger A. Brekken, Hastings, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 15, 1973, Ser. No. 323,844
Int. Cl. B32b *3/00*, *33/00*
U.S. Cl. 161—116 **9 Claims**



1. An integral heat-set, biaxially oriented composite film comprised of a layer of transparent polyethylene terephthalate having a smooth exposed major surface and an internally transparent copolyester layer having a matte exposed major surface, the copolyester layer having a softening temperature range at least part of which is lower than the melting temperature of said polyethylene terephthalate layer wherein the copolyester layer contains from more than 50 mole percent to less than 90 mole percent ethylene terephthalate and correspondingly from less than 50 mole percent to more than 10 mole percent ethylene isophthalate or ethylene hexahydrophthalate.

4. An integral heat-set, biaxially oriented composite film comprised of a layer of transparent polyethylene terephthalate layer having a smooth exposed major surface and a transparent copolyester layer having an embossed major surface, the copolyester having a softening temperature less than that of said polyethylene terephthalate layer wherein the copolyester layer contains from more than 50 mole percent to less than 90 mole percent ethylene terephthalate and correspondingly from less than 50 mole percent to more than 10 mole percent ethylene isophthalate or ethylene hexahydrophthalate.

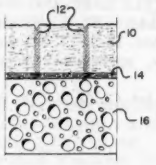
6. A pressure-sensitive adhesive tape which is dimensionally stable, strong, tough, water-resistant, has a surface suitable for writing thereon and is transparent when applied to a substrate, comprising, in combination, an integral heat-set biaxially oriented composite film comprised of a layer of transparent polyethylene terephthalate having a smooth exposed major surface and a transparent copolyester layer having a matte exposed major surface and a layer of tacky pressure-sensitive adhesive uniformly covering said smooth exposed major surface wherein the copolyester layer contains from more than 50 mole percent to less than 90 mole percent ethylene terephthalate and correspondingly from less than 50 mole percent to more than 10 mole percent ethylene isophthalate or ethylene hexahydrophthalate.

3,871,948

NON-WOVEN CARPET MATERIAL WITH RESILIENT BACKING

Alan H. Norris, Somers, Conn., assignor to Bigelow-Sanford, Inc., New York, N.Y.

Continuation of Ser. No. 130,155, April 1, 1971, abandoned. This application June 22, 1973, Ser. No. 372,634
Int. Cl. B32b *7/04*
U.S. Cl. 161—154 **6 Claims**



1. Carpet material comprising a layer of substantially resilient material having a predetermined height and providing a base support of said carpet material;

a layer formed of non-woven fibers being vertically intermixed by needling, said layer having a height less than the height of said resilient backing and including top and bottom surfaces;

each of said top and bottom surfaces being heat fused and thereby leaving interior fibers of said non-woven layer mobile, said bottom surface being attached to said resilient layer, and said top surface forming a non-tufted wear surface of said carpet material.

3,871,949

FERMENTATION CONTROL-CONTAINING LAMINATE

Joseph G. Forest, P.O. Box 29, Waverly, N.Y. 14892, and Edward J. Czarnetzky, Box 88, Chazy, N.Y. 12921

Continuation-in-part of Ser. No. 263,130, June 15, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 441,307
Int. Cl. C09j ; B32b *29/06*, *27/18*
U.S. Cl. 161—165 **19 Claims**

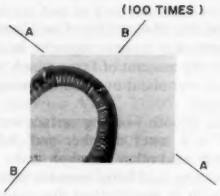
1. A fermentation control-containing laminate for retarding the spoilage of silage and the like and for promoting the production of beneficial acids and bacteria during silage storage, which comprises:

a. a polyvinylidene chloride resin layer, and
b. a layer of Kraft paper impregnated with sodium sulfate and malt diastase,
said malt diastase being present in an amount of from one to fifty parts by weight per fifty parts by weight of sodium sulfate.

3,871,950
HOLLOW FIBERS OF ACRYLONITRILE POLYMERS FOR ULTRAFILTER AND METHOD FOR PRODUCING THE SAME

Yasuo Hashino, Matsudoshi; Masatsugu Yoshino, Tokyo; Hitoshi Sawabu, Tokyo, and Tsugio Konno, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 26, 1973, Ser. No. 354,785
Claims priority, application Japan, Apr. 28, 1972, 47-42750; Dec. 29, 1972, 48-1578
Int. Cl. T07g *3/00;* **B01d** *31/00*
U.S. Cl. 161—178 **3 Claims**



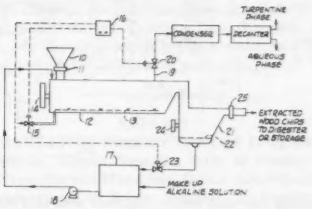
1. A hollow fiber of acrylonitrile polymer for ultrafilter, having a water-permeability greater than 0.2 ml/cm².min. atm.; said acrylonitrile polymer containing at least 60% by mol of acrylonitrile units; said hollow fiber having a structure consisting of:

1. a reticulate porous region concentric with the central axis of said hollow fiber, the pores of said reticulate porous region being essentially of the same size; said reticulate porous region including therewithin at least one succession of voids concentric with the central axis of said hollow fiber, each void defining a closed cylindrical or revolving ellipsoid shape having a diameter in the direction of its short axis of 10 to 50 μ and a long axis that points essentially toward the central axis of said hollow fibers and a cross-section perpendicular to the long axis that is nearly circular; the lengths of the long axes of said voids being at least two times the diameters of their cross-sections and the diameters of their cross sections being almost equal on the same assumptive cylindrical surfaces whose central axes are the same as the central axis of said hollow fibers, and
2. a gradient-type porous region adjacent to the outer portion of said reticulate porous region or to each of the outer and inner portions of said reticulate porous region and concentric with the reticulate porous region and the central axis of said hollow fiber, the size of pores in the gradient-type porous region having a gradient in that the average size of pores contained in a gradient-type porous region becomes smaller toward the outer surface of said hollow fibers and the average size of pores contained in a gradient-type porous region adjacent the inner portion of said reticulate porous region becomes smaller toward the inner surface of said hollow fibers; the average size of pores in a gradient type porous region decreasing from about 5μ -1μ adjacent the reticulate porous region to about 0.1μ -several A at a surface of said hollow fiber.

3,871,951
TURPENTINE RECOVERY BY STEAM DISTILLING WOODCHIPS WHILE THEY ARE IMMERSED

John Drew, Jacksonville, Fla., assignor to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 187,160, Oct. 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 853,162, Aug. 26, 1969, abandoned. This application Nov. 1, 1973, Ser. No. 411,641
Int. Cl. D21c *1/02, 1/06*
U.S. Cl. 162—14 **4 Claims**



1. In the recovery of turpentine from a woodpulping process wherein woodchips are digested in an alkaline digestion liquor to yield woodpulp and vaporous products containing turpentine, the improvement which comprises:

immersing said woodchips prior to digestion to pulp in an aqueous alkaline solution having a normality of alkali metal hydroxide in the range of about 0.20 to about 2.0, said solution being present in an amount sufficient to provide alkali metal hydroxide in the range of about five times to about 200 times the theoretical amount required to neutralize the tall oil acids present in said woodchips;

steam distilling from the woodchips while they are immersed prior to digestion a product consisting essentially of turpentine for a sufficient time less than about two hours to liberate at least about 70% by weight of the available turpentine but for a temperature and said time insufficient for digesting said woodchips to woodpulp; and

condensing the steam distillate and separating and collecting turpentine for the steam distillate, said steam distillate being substantially free of tall oil rosins and soaps;

the turpentine recovered being substantially free of sulfurous by-products.

3,871,952
MANUFACTURE OF NON-WOVEN FIBROUS MATERIAL FROM A FOAMED FURNISH

Neil George Douglas Robertson, Marlow, England, assignor to Wiggins Teape Research & Development Limited, London, England

Filed Apr. 6, 1973, Ser. No. 348,596
Claims priority, application United Kingdom, Apr. 7, 1972, 16210/72; Mar. 30, 1973, 15344/73
Int. Cl. D21d *3/00*
U.S. Cl. 162—101 **4 Claims**

1. A process for manufacturing a non-woven fibrous material from a foamed fiber dispersion fed to a foraminous support from a foaming device wherein the amount of surface active agent required is reduced, the process comprising:

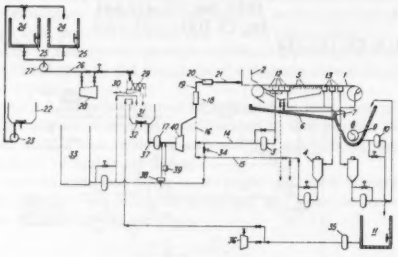
establishing an air/water/fibers/surface active agent mixture provided by a mixer;

delivering said mixture to a closed foaming device and effecting foaming thereof by the creation of turbulence without the use of moving mechanical means to establish said foamed fiber dispersion;

feeding said foamed fiber dispersion to said foraminous support;

recovering, by vacuum draining through vacuum box means, a major part of the liquid, generally in a foamed condition, from said foamed fiber dispersion on said foraminous support;

recirculating said liquid so recovered generally in a foamed condition directly from said vacuum box means to said mixer;



introducing into said mixer, together with said recirculated liquid, fibers, water and metered quantities of air and make-up surface active agent;

directing the contents of said mixer to said foaming device; and

repeating said feeding, recovering, recirculating, introducing and directing steps.

3,871,953

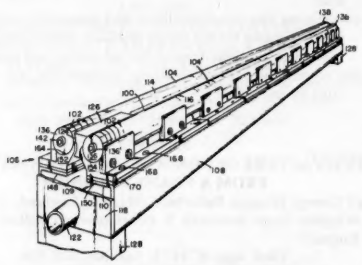
PAPERMAKING SYSTEM INCLUDING A FLEXIBLE CERAMIC MEMBER HAVING A PRE-LOADED TENSILE FORCE APPLYING MEANS

Charles A. Lee, Knoxville, and Robert F. Hunt, Concord, both of Tenn.

Continuation-in-part of Ser. Nos. 273,027, July 19, 1972, abandoned, and Ser. No. 273,307, July 19, 1972, abandoned, and Ser. No. 377,893, July 10, 1973, abandoned. This application Mar. 28, 1974, Ser. No. 455,678

Int. Cl. D21f *1/48;* **D21g** *3/00*

U.S. Cl. 162—274 **13 Claims**



1. In a papermaking system including at least two members one of which is movable relative to the oter and in frictional engagement therewith, and in which system at least one of said members is subjected to deflection, the improvement wherein said latter member comprises

an elongated flexible assemblage including a plurality of ceramic segments, each having at least two opposite surfaces that are substantially flat and parallel, said segments being aligned with their flat faces in abutting face-to-face relation and in respective planes that are oriented substantially perpendicular to the composite length of said plurality of segments,

tension means extending between opposite ends of said assemblage and forcing said segments toward each other in a direction along their composite length and substantially perpendicular to their respective parallel faces with a preload force on said tension means, when said latter member is in an undeflected condition, that is at least the force calculated by the equation:

$$P = [(E_c A_c)(8dh/l^2 + 4d^2)/2\ (L)] + [(\alpha_s - \alpha_c)\ \Delta T]/[(1/A_s E_s) + (1/A_c E_c)]$$

where:

P is the preload of said tension means, in pounds;

E_c is the modulus of elasticity of the ceramic material;

A_c is the cross-sectional area of a ceramic segment in a plane perpendicular to the composite length of said assemblage, in square inches;

d is the maximum anticipated deflection of said assemblage, in inches,

h is the dimension of a ceramic segment in the plane perpendicular to the composite length of said assemblage and in alignment with the direction of said deflective force, in inches;

l is the overall length of said assemblage;

α_s is the coefficient of thermal expansion of said tension means;

α_c is the coefficient of thermal expansion of said ceramic;

ΔT is the degrees of temperature change anticipated, in degrees F.;

A_s is the cross-sectional area of said tension means;

E_s is the modulus of elasticity of said tension means, and

L is the length of a ceramic segment, in inches,

but less than the amount of force which will compress said ceramic to over about one-half of its maximum compressive strength,

an elongated smooth working surface extending along the length of said latter member and defining an area of contact with said other member, and

means supporting said latter member relative to said other member with its longitudinal dimension oriented generally transversely of the direction of relative movement of said members whereby loading forces exerted upon said latter member are directed thereagainst in a direction substantially perpendicular to the longitudinal dimension thereof and deflection of said latter member pursuant to such loading forces is compensated for in said compressed segments by further compression of said segments in those portions of the abutting faces thereof disposed along the inside of the line of curvature of said latter member and by relief of less than all of the compression in those portions of said abutting faces that are disposed along the outside of said line of curvature of said member without physical separation of said segments at their abutting faces.

3,871,954

CELL LINES AND VIRUS CULTURE

Arie Jeremy Zuckerman, London, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 62,607, Aug. 10, 1970, abandoned. This application Jan. 4, 1974, Ser. No. 430,918

Claims priority, application Great Britain, Aug. 22, 1969, 42062/69

Int. Cl. C12k *9/00*

U.S. Cl. 195—1.1 **4 Claims**

1. A virus cultivation process which comprises maintaining a viable culture of cells derived from the human embryo liver cell line designated by A.T.C.C. Number CL.99 in a synthetic nutrient culture medium, inoculating the culture with a virus to which the cells are susceptible and cultivating the virus in the culture.

3,871,955

PROCESS FOR AUTOMATED PRODUCTION OF SYNCHRONOUS MAMMALIAN CELLS

Robert R. Klevecz, 227 Bettyhill Dr., Duarte, Calif. 91010

Filed May 14, 1973, Ser. No. 360,047

Int. Cl. C12k *9/00*

U.S. Cl. 195—1.8 **9 Claims**

1. A process for automated production of synchronous

mammalian cells, comprising:
adding a suitable medium to a series of roller bottles in a roller apparatus;
incubating the medium;
subculturing the medium with mammalian cells;
allowing growth of the cells for about 24 hours;
initiating turning of the roller bottles by automatic controllers at a speed sufficiently slow to prevent detaching said cells;
speeding up the turning of the roller bottles by automatic controllers to a speed sufficient to detach rounded mitotic cells;
removing the detached rounded mitotic cells from the roller bottles;
collecting the detached rounded mitotic cells in a manifold; and
discharging said cells into a growth flask through a valve.

3,871,956

MICROBIAL DEGRADATION OF PETROLEUM

Edward N. Azarowics, Vienna, Va., assignor to Bioteknika International Inc., Alexandria, Va.

Continuation-in-part of Ser. No. 43,226, June 3, 1970, Pat. No. 3,769,164. This application Feb. 20, 1973, Ser. No. 333,707
Int. Cl. C12b *1/00*
U.S. Cl. 195—2 **12 Claims**

1. A process for the microbial degradation of aqueous polluting petroleum and oily wastes which comprises treating the petroleum or oily waste with at least one microorganism selected from the group consisting of *Nocardia corallina* ATCC 21504, *Nocardia globerula* ATCC 21505, *Nocardia globerula* ATCC 21506, *Nocardia opaca* ATCC 21507, *Nocardia rubra* ATCC 21508 and *Nocardia paraffinae* ATCC 21509, and mutants thereof, in an aqueous system for a sufficient time until the treated petroleum oily waste has been substantially degraded.

3,871,957

USE OF MICROORGANISMS TO DISPERSE AND DEGRADE OIL SPILLS

Raam R. Mohan, Berkeley Heights; George H. Byrd, Jr., Red Bank; James Nixon, Westfield, and Edward R. Bucker, Cranford, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed May 9, 1973, Ser. No. 358,640
Int. Cl. C12b *1/100*
U.S. Cl. 195—2 **6 Claims**

1. A method for protecting beaches and shorline solid surfaces against oil contamination, said method comprising the steps of pretreating said beach or shoreline solid surface with a water slurry said water slurry prepared by admixing mutually compatible microorganism cells, said microorganism cells being selected from the group consisting of Arthrobacter, Micrococcus and Achromobacter, and mixtures thereof, with an inert absorbent substance; drying said mixture at a room temperature ranging from 25° to 55°C so as to form an anhydrous powder, reconstituting said anhydrous powder with an aqueous phase so as to generate a slurry thereby maintaining the viability and biological activity of the microorganism and coating said beach or shoreline solid surface with said aqueous slurry of viable mutually compatible microorganism cells.

3,871,958

BIOLOGICAL METHOD OF PRODUCING SERINE AND SERINOL DERIVATIVES

Hidetsugu Nakazawa, Kawasaki; Hitoshi Enei, Zushi; Koji Kubota, Kawasaki, and Shinji Okumura, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 28, 1973, Ser. No. 336,808
Claims priority, application Japan, Mar. 4, 1972, 47-22650; Apr. 13, 1972, 47-37296
Int. Cl. C12d *13/06*
U.S. Cl. 195—29 **10 Claims**

1. A method of producing a serine derivative of the formula

which comprises reacting an aldehyde of the formula R-CHO with glycine in aqueous solution in the presence of an effective amount of a source of an enzyme capable of condensing glycine and the aldehyde at pH 5 to 10 at 5° to 60°C until said serine derivative is formed, and recovering said serine derivative from said solution; in said formulas, R being an organic radical having at least two carbon atoms, said enzyme source being a member of the group consisting of intact and comminuted cells of Escherichia, Citrobacter, Klebsiella, Aerobacter, Serratia, Proteus, Bacillus, Staphylococcus, Arthrobacter, Bacterium, Xanthomonas, Candida, Debaryomyces, Corynebacterium, and Brevibacterium, broth in which said cells have been cultivated, and an extract of said cells.

3,871,959

FERMENTATIVE PRODUCTION OF D-ALANINE

Ichiro Chibata; Shigeki Yamada, both of Osaka; Mitsuru Wada, Nara; Haruko Maeshima, Osaka, and Nobuhiko Izuo, Yamatotakada, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed July 17, 1973, Ser. No. 379,956
Claims priority, application Japan, July 28, 1972, 47-76329
Int. Cl. C12d *13/06*
U.S. Cl. 195—29 **19 Claims**

1. A process for producing D-alanine which comprises cultivating a *Corynebacterium fascians* ATCC No. 21950 in an aqueous nutrient medium under aerobic conditions to produce a fermentation broth, and recovering D-alanine from the fermentation broth.

3,871,960

METHOD OF PRODUCING L-LYSINE BY FERMENTATION

Koji Kubota; Yasuhiko Yoshihara, both of Kawasaki, and Hiroshi Okada, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Sept. 25, 1973, Ser. No. 400,552
Claims priority, application Japan, Oct. 9, 1972, 47-101446
Int. Cl. C12d *1/00*
U.S. Cl. 195—29 **4 Claims**

1. A method of producing L-lysine which comprises:
a. culturing a lysine-producing strain of Corynebacterium under aerobic conditions in an aqueous medium containing assimilable sources of carbon and nitrogen, inorganic salts and organic substances required for the growth of said strain at pH 5 to 9 until L-lysine accumulates in said medium; and
b. recovering the accumulated lysine from said medium,
1. said strain being resistant to feedback inhibition by 1 mg/ml S-(2-aminoethyl)-L-cysteine,
2. the growth of said strain being severely inhibited during 24 hours cultivation on a minimal medium when said minimal medium is supplemented with 0.1 millimole per liter methionine, and
3. the inhibition of said growth by said methionine not being overcome by addition of L-threonine in any amount up to 100 millimole per liter.

3,871,961

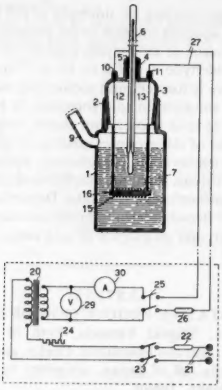
METHOD FOR ACCELERATING THE GROWTH AND INCREASING THE YIELD OF MICROORGANISMS

Matilde Gianessi, Via Baldissera 2, Milan, Italy

Filed Mar. 15, 1973, Ser. No. 341,792
Int. Cl. C12b *1/22*
U.S. Cl. 195—37 **4 Claims**

1. A method for accelerating the growth of the microorganism Penicillum Widemanni, comprising establishing a liquid culture medium of said microorganism, immersing a coil com-

prising a few dozens of insulated turns of electrically conductive material in said culture medium, passing through said coil an alternating current having a voltage of 1 and an amperage



of 1.8, and maintaining said coil immersed in said medium, with said current passing therethrough for a period of time sufficient to achieve the growth of a substantial quantity of said microorganism.

3,871,962

PENICILLIN ACYLASE

Carl Kutzbach, Wuppertal, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 16, 1972, Ser. No. 297,856

Claims priority, application Germany, Oct. 14, 1971, 2151236; Apr. 13, 1972, 2217745

Int. Cl. C07g *7/02*

U.S. Cl. 195—62 **32 Claims**

1. A process for the purification of penicillin acylase from penicillin acylase producing bacteria, initially in the form of a solution, comprising sorbing the penicillin acylase on an aluminosilicate to produce a sorbate, separating the sorbate from the solution, and eluting the penicillin acylase from the sorbate to produce a second, purer, solution of penicillin acylase.

3,871,963

MICROBIAL PROTEASE AND PREPARATION THEREOF

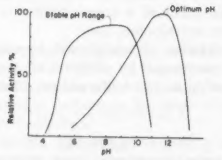
Sadanobu Tobe, Tokyo; Yoshiteru Hirose, Yokohama; Yoshihiro Nakamura, Tokyo, and Koji Mitsugi, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Mar. 13, 1973, Ser. No. 340,841

Claims priority, application Japan, Mar. 18, 1972, 47-27973

Int. Cl. C12d *13/10*

U.S. Cl. 195—62 **2 Claims**



1. A method of producing a protease having optimum pH between 11 and 12 and being stable at pH 5.5 to 9.0 when heated 30 minutes to 50°C in an aqueous medium which comprises:

a. culturing the gram-positive, asporogenous strain Bacillus sp. FERM P-1396 in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen, inorganic salts, and minor organic nutrients until a significant amount of said protease is accumulated in said medium; and

b. recovering the accumulated protease from said medium.

3,871,964

WATER-INSOLUBLE PEPTIDE MATERIALS

Fritz Huper; Erich Rauenbusch; Gunter Schmidt-Kastner, all of Wuppertal; Bruno Bomer, Leverkusen, and Herbert Bartl, Odenthal-Hahnenberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 27, 1973, Ser. No. 345,452

Claims priority, application Germany, Mar. 30, 1972, 2215687

Int. Cl. C07g *7/02*

U.S. Cl. 195—63 **31 Claims**

1. A water-insoluble preparation comprising dn enzyme or polypeptide enzyme inhibitor bound to a crosslinked copolymer comprising the following copolymerized units:

A. about 0.1 to 30 wt.% of at least one α,β-monoolefinically unsaturated dicarboxylic acid anhydride having 4 to 9 carbon atoms;

B. about 35 to 90 wt.% of at least one di- and/or poly(meth) acrylate of a diol and/or a polyol; and

C. about 5 to 60 wt.% of at least one hydrophilic monomer containing a carboxyl, aminocarbonyl, sulfo or sulfamyol group.

3,871,965

PRODUCTION OF RIFAMYCIN B

Richard J. White, Como, and Giancarlo Lancini, Pavia, both of Italy, assignors to Gruppo Lepetit S.p.A, Milan, Italy

Filed Apr. 26, 1973, Ser. No. 354,811

Claims priority, application Italy, May 5, 1972, 23926/72

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 R **1 Claim**

1. In a fermentation process for the production of rifamycin B, the improvement which comprises fermenting under aerobic conditions and in the absence of barbiturate a fermentation medium consisting essentially of an assimilable carbon source, an assimilable nitrogen source and essential mineral salts with a mutant identified as *Streptomyces mediterranei M* 18 ATCC 21789 until the fermentation medium shows substantial antibiotic activity, and recovering rifamycin B from the fermentation medium.

3,871,966

PROCESS FOR THE PRODUCTION OF ANTIBIOTICS

Carmine Renato Pasqualucci, Milan, and Giuseppe Zucco, Rovereto, both of Italy, assignors to Arckifar Industrie Chimiche Del Trentino S.p.A., Rovereto, Trento, Italy

Filed Oct. 12, 1973, Ser. No. 405,829

Claims priority, application Italy, Nov. 29, 1972, 32248/72

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 R **1 Claim**

1. A process for producing Rifamycin B, comprising:

cultivating the mutant known as Streptomyces G 5/A capable of high productivity, in a buffered nutrient medium containing assimilable sources of carbon, nitrogen and inorganic salts under submerged aerobic conditions.

3,871,967

SYNTHETIC NUTRIENT MEDIUM FOR MICROORGANISMS AND METHOD OF USE

Mohamed Abdou, and Karl Buchta, both of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

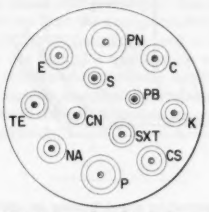
Filed Jan. 11, 1974, Ser. No. 432,546

Int. Cl. C12b *3/02, 3/12*

U.S. Cl. 195—100 **3 Claims**

1. A nutrient medium composition for microorganisms, in particular for germs which cause urinary tract infections, consisting essentially of water and about 0.25 to 1 gm of L-arginine, 0.5 – 2 gm of L-asparaginic acid, 0.25 – 1 gm of

L-cysteine, 1 – 4 gm of L-glutaminic acid, 0.1 – 0.4 gm of glycocoll, 0.15 – 0.6 gm of L-histidine, 0.4 – 1.6 gm of L-leucine, 0.25 – 1 gm of L-isoleucine, 0.2 – 1.3 gm of L-lysine, 0.15 – 0.6 gm of L-methionine, 0.15 – 0.6 gm of L-phenylalanine, 0.2 – 0.8 gm of L-proline, 0.2 – 0.8 gm of L-threonine, 0.05 – 0.2 gm of L-tryptophane, 0.2 – 0.8 gm of L-tyrosine, 0.5 – 2 gm of L-valine, 1.5 – 6 gm of sodium-chloride, 0.15 – 0.6 gm of potassium chloride, 0.5 – 2 gm of anhydrous sodium acetate, 0.5 – 2 gm of sodium pyruvate, 3 – 12 gm of sodium glycerophosphate pentahydrate, 0.025 – 0.1 gm of magnesiumsulfate heptahydrate, 0.005 – 0.02 gm of adenine, 0.005 – 0.02 gm of guanine, 0.005 – 0.02 gm of



uracil, 1 – 4 gm of D-glucose, 0.005 – 0.02 gm of inosite, 0.005 – 0.02 gm of choline chloride, 0.005 – 0.02 gm of nicotinic acid amide, 0.005 – 0.02 gm of thiamine hydrochloride, 0.0005 – 0.002 gm or riboflavin, 0.003 – 0.012 gm of pyridoxin hydrochloride, 0.005 – 0.02 gm of calcium pantothenate, 0.005 – 0.02 gm of folic acid, 0.0001 – 0.0004 gm of biotin, 0.0025 – 0.01 gm of p-nitrophenylpropanetriol, 0.05 – 0.2 gm of pimaricin per liter of water, as well as a quantity of dilute aqueous sodium hydroxide dilution necessary for adjusting the pH of the composition to 7.2, and optionally a quantity of agar (free from germ growth inhibiting or antimicrobial agent antagonizing substances) necessary for solidification of the nutrient medium.

3,871,968

MULTISTAGE EVAPORATORS

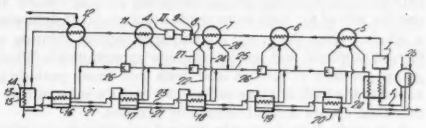
Frank Chiltern Wood, Broadstone, and Allan Barker, Chester, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 16, 1973, Ser. No. 351,546

Claims priority, application Great Britain, Apr. 21, 1972, 18703/72

Int. Cl. B01d *1/26;* **C23f** *17/00*

U.S. Cl. 202—173 **8 Claims**



1. A multistage evaporator plant comprising an inlet for feed liquid, a chain of liquid preheaters interconnected with one another and with the inlet by pipe connections, a feed liquid heater, a number of evaporator compartments interconnected in series, conduits for communicating the chain of liquid preheaters with the heater inlet and for communicating the heater outlet with an evaporator compartment, said pipe connections including a branch pipe connected to bypass the heater and direct feed liquid to one of the evaporator compartments, a high temperature scale inhibiting treatment plant, pipe work connected to the high temperature scale inhibiting additive plant and a portion in the preheater chain between the branch pipe and the heater, and a low temperature scale inhibiting treatment plant for treating at least the feed liquid bypassing the heater.

3,871,969

APPARATUS FOR PURIFYING HF

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 203,768, Dec. 1, 1971,. This application Oct. 23, 1973, Ser. No. 409,017

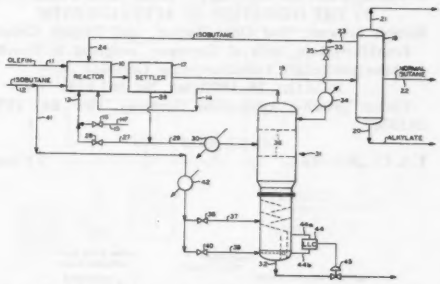
Int. Cl. B01d *3/06, 3/24*

U.S. Cl. 202—234 **7 Claims**

1. Apparatus adapted for use in purifying an HF stream by removing acid soluble oil therefrom comprising:

an elongated upright vessel having first vapor-liquid contacting means in the upper region thereof and second vapor-liquid contacting means in the lower region thereof; an inclined transverse baffle means defining the lower extremity of said second vapor-liquid contacting means, said inclined baffle having at least one opening in the upper portion thereof to permit vapor to flow upwardly therethrough;

a first generally vertical baffle extending across the bottom of said vessel below said second contacting means and cooperating with said inclined baffle to direct liquid flowing downwardly from said second contacting means to a first zone defined between said first baffle and the side of the vessel located in the bottom of said vessel, said first baffle defining an opening at the lower end thereof;



a second generally vertical baffle extending across the bottom of said vessel in spaced relationship with said first baffle and generally parallel thereto so that liquid can flow from said first zone through said opening at the lower end of said first vertical baffle into a second zone defined between said first and second baffles and then upwardly between said baffles and over said second baffle to a third zone located in the bottom of said vessel; and a sparger having a plurality of openings therein positioned in the lower portion of said second zone between said baffles to permit introduction of a stripping vapor between said baffles, said vessel being provided with a first outlet at the top thereof to permit removal of a purified HF containing stream, a first inlet above said first contacting means to permit introduction of a reflux liquid, a second inlet in said upper region to permit introduction of a feed stream, and a second outlet communicating with said second zone to permit removal of acid soluble oil.

3,871,970

WORKING UP HYDROFORMYLATION MIXTURES

Hans Juergen Nienburg, Ludwigshafen, and Rudolf Kummer, Frankenthal, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Aug. 30, 1972, Ser. No. 284,759

Claims priority, application Germany, Sept. 11, 1971, 2145532

Int. Cl. B01d *3/34*

U.S. Cl. 203—6 **2 Claims**

1. A process for working up by distillation a hydroformylation mixture obtained by reaction of an olefin of three to

twenty carbon atoms with carbon monoxide and hydrogen at a temperature of from 140° to 220°C and at a pressure of from 30 to 300 atmospheres in the presence of a cobalt, rhodium, ruthenium or iridium carbonyl complex which has been modified with a tertiary organic phosphine wherein the organic portion is selected from the group consisting of alkyl of one to thirty carbon atoms, cycloalkyl of five to twelve carbon atoms, aralkyl of seven to ten carbon atoms and aryl of six to ten carbon atoms as a substituent, said mixture containing from 60 to 70 percent by weight of produced aldehyde and alcohol containing one more carbon atom than the olefin used, from 15 to 30 percent by weight of the acetal of the aldehyde and alcohol produced and esters of said alcohol, and from 2 to 6 percent by weight of metal carbonyl complex and tertiary phosphine, wherein a fatty acid having three to ten carbon atoms is added to the hydroformylation mixture after the separation therefrom of excess carbon monoxide and hydrogen, and the resultant hydroformylation mixture is then distilled in the presence of the added fatty acid.

3,871,971

EXTRACTIVE RECOVERY OF A MANGANESE ACETATE CATALYST FROM RESIDUE RECOVERED FROM DISTILLATION OF AN ACETIC ACID FEED PRODUCED BY THE OXIDATION OF ACETALDEHYDE

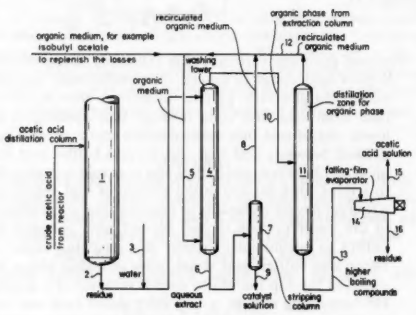
Helmut Schaum, Bad Oden/Taunus, and Helmut Gossel, Frankfurt/Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Filed Oct. 26, 1972, Ser. No. 301,175

Claims priority, application Germany, Oct. 28, 1971, 2153767

Int. Cl. B01d *11/00*

U.S. Cl. 203—43 **3 Claims**



1. A process for the manufacture of acetic acid comprising the steps of:

1. oxidizing acetaldehyde in a mixture containing a manganese acetate catalyst and thereby forming a mixture of acetic acid, acetaldehyde, manganese acetate and other higher and lower boiling components;
2. passing the mixture formed in 1 to a distillation zone and removing therefrom an overhead product comprising acetaldehyde, acetic acid and lower boiling components and a bottoms stream comprising manganese acetate and higher boiling components;
3. contacting said bottoms stream, in a liquid-liquid extraction zone with water and with a substantially water immiscible, organic liquid in which said higher boiling components are soluble, and thereby extracting the said manganese acetate in water solution and extracting said higher boiling components in said organic liquid.

3,871,972

ELECTRORECORDING SHEET

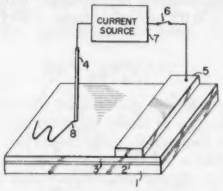
Yoichi Sekine, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 3, 1973, Ser. No. 320,821

Claims priority, application Japan, Mar. 24, 1972, 47-30088

Int. Cl. B41m *5/20;* **G01d** *15/34*

U.S. Cl. 204—2 **10 Claims**



1. An electro-recording sheet having an electroconductive layer of cuprous iodide which has a surface resistivity of less than $10^6\Omega$ at a temperature of 20°C and a relative humidity of 65 percent and a color forming layer provided in contact with said electroconductive layer and which forms a mark due to selective color formation or color change in the parts of said color formation layer to which electric current is applied through said electroconductive layer.

3,871,973

ELECTROPLATING OF IRON AND COATING SUBSTRATES WITH AN IRON-ALUMINUM COATING

Frederick William Topham, Deeside, Wales, assignor to British Steel Corporation, London, England

Filed June 4, 1973, Ser. No. 366,760

Claims priority, application United Kingdom, June 20, 1972, 28775/72

Int. Cl. C23b *5/04, 5/52, 5/58*

U.S. Cl. 204—28 **13 Claims**

1. A method of forming a coating on a substrate comprising an electroplating step utilizing a cathodic current density in the range of approximately 150–500 amps per square foot while employing an acidic, aqueous electroplating bath containing an additive which is selected from the group consisting of citrates and citric acid, the citrate ion concentration in the bath being in the range of approximately 2–32 grams per litre and the rest of the bath being made up of an electrolyte which is selected from the group consisting of ferrous chloride and ferrous sulphate and which contains approximately 50–150 grams per litre of ferrous iron, with iron being periodically added to the bath at a rate sufficient to reduce substantially all the ferric citrate formed therein by aeration.

2. A method as claimed in claim **1** in which the method is employed to provide a ferrous substrate with a coating of metallic iron.

3. A coating method as claimed in claim **2** further including the steps of:

A. wetting the iron coating with an aqueous alkali metal silicate solution,

B. coating the wetted iron coating with a layer of aluminum powder which forms an alloy with the substrate when heat treated at a temperature within the range of 500°–650°C,

C. compacting the aluminum powder layer and the iron coating to the surface of the substrate at a temperature at which sintering will not occur during the compaction, and

D. heat-treating the compacted substrate at a temperature within the range of 500°–650°C to sinter and bond the aluminum particles to each other and to the substrate.

5. A method as claimed in claim **2** in which the ferrous substrate is passed through the bath during plating.

3,871,974

ALKALINE BRIGHT ZINC PLATING

Joseph R. Duchene, Southfield, Mich., and Phillip J. DeChristopher, Chicago, Ill., assignors to The Richardson Chemical Company, Des Plaines, Ill.

Filed Sept. 24, 1973, Ser. No. 400,240
Int. Cl. C23b 5/10, 5/46
U.S. Cl. 204—55 R 27 Claims

1. A bright zinc, cyanide free electroplating bath comprising an aqueous alkaline solution containing a source of zinc ions, from about 0.1 to about 5 grams per liter of a brightener containing a carbonyl group of aldehyde functionality, from about 0.01 to about 0.2 grams per liter of a heterocyclic compound selected from the group consisting of a 2-mercapto substituted pyridine or pyrimidine and from about 0.25 to about 5 grams per liter of a quarternary salt of a polymeric condensate of an alkylene polyamine having at least one tertiary amino group and an epihalohydrin wherein the mol ratio of the polyamine to the epihalohydrin ranges from about 0.5:1 to 1.75:1, respectively.

3,871,975

ELECTROLYTIC PROCESS FOR PRODUCTION OF PERFLUOROCYCLOHEXANE DERIVATIVES

Shunji Nagase, 13-1, Aza-Shikannonmichi-Nishi, Tashiro-cho, Chigusa-ku; Hajime Baba, 34-140, Aza-Togasama, Ohaza-Inokoishi, Idaka-cho, Chigusa-ku; Kazuo Kodaira, 1. Hirate-cho, 1 chome, Kita-ku; Takashi Abe, 34-140, Aza-Togasama, Ohaza-Inokoishi, Idaka-cho, Chigusa-ku, and Michimasa Yonekura, 19, Shinike-cho, 1 chome, Chigusa-ku, all of Nagoya, Japan

Filed Mar. 12, 1973, Ser. No. 340,602
Claims priority, application Japan, June 1, 1972, 47-54698
Int. Cl. B01k 3/00
U.S. Cl. 204—59 F 4 Claims

3. The process according to claim 1 wherein the electrolized solution contains a member selected from the group consisting of benzotrifluoride, bis(trifluoromethyl) benzene, and p-chlorobenzotrifluoride.

3,871,976

ELECTROCHEMICAL ADIPONITRILE PROCESS

John F. Connolly, Chicago, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Sept. 10, 1973, Ser. No. 395,720
Int. Cl. C07b 29/06; C07c 121/02, 121/26
U.S. Cl. 204—73 A 10 Claims

1. The process for the electrochemical hydrodimerization of acrylonitrile to adiponitrile in an electrochemical cell containing acrylinitrile dissolved in an aqueous-electrolyte, wherein ammonia is added to the cell and oxidized at or near the anode.

3,871,977

ELECTROLYTIC PROCESS FOR THE MANUFACTURE OF ALPHA-KETOGLUTARATE ESTERS

Charles J. V. Scanio, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed June 7, 1974, Ser. No. 477,491
Int. Cl. C07b 3/00; B01k 1/00
U.S. Cl. 204—78 6 Claims

1. A continuous process for producing a mixture of δ-monoesters and diesters of α-ketoglutaric acid and the corresponding ketals thereof which comprises electrolysis of a solution of 2-furoic acid in alcoholic solvent containing acid catalyst at a concentration of from about 0.01 to 1 mole per liter, wherein said alcoholic solvent is an alkanol of from about one to five carbon atoms, and wherein said acid catalyst is a reaction inert acid of pK_a less than about 2.5, and continuing said electrolysis until a substantial amount of said mixture of esters and ketals of α-ketoglutaric acid is formed.

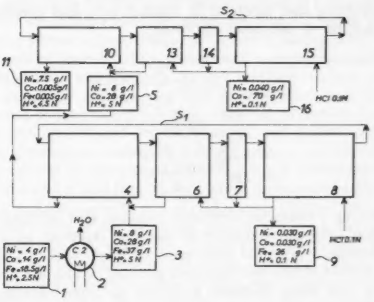
3,871,978

PROCESS FOR THE PRODUCTION OF HIGH-PURITY METALS FROM NICKELIFEROUS MATTES

Louis Gandon, Rambouillet, and Robert Lemarinel, Elancourt, both of France, assignors to "Le Nickel", Paris Cedex, France

Filed Nov. 28, 1973, Ser. No. 419,533
Claims priority, application France, Dec. 1, 1972, 72.42776
Int. Cl. C22d 1/14; C22b 23/04
U.S. Cl. 204—113 11 Claims

1. In a method for producing high-purity nickel from pure nickel matte containing cobalt and other impurities comprising successively the following steps: (a) communiting and roasting said impure matte at a temperature of about 900°C to obtain impure nickel oxide; (b) dissolving this impure nickel oxide in concentrated hydrochloric acid; (c) oxidizing to the ferric state the iron which is contained in the impure solution resulting from the preceding step; (d) removing the impurities from this solution by means of ion-exchange resin to produce a purified nickel chloride solution and selectively eluting said impurities to recover a cobalt chloride solution; and (e) subjecting the purified nickel chloride solution to an electrolysis



to recover high-purity nickel; the improvement according to which said ion-exchange resin containing said impurities is eluted by means of approximately decinormal hydrochloric acid, the eluate obtained is concentrated and then placed in contact consecutively with a first organic solvent to extract iron and a second organic solvent to extract cobalt to produce a pure nickel chloride solution, the first organic solvent is washed, decanted and then subjected to an iron re-extraction operation to produce a solution rich in iron, and the second organic solvent is washed, decanted and then subjected to a cobalt re-extraction operation to produce a purified cobalt chloride solution.

3,871,979

NEW PHOTOCHEMICAL PROCESS FOR PRODUCING 9-OXYGENATED-11α-HYDROXYMETHYL-15α-HYDROXYPROSTA-5-CIS,13-TRANS-DIENOIC ACIDS

Angel Guzman, Mexico D.F., Mexico, and Michael Marx, Cupertino, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 1, 1974, Ser. No. 447,323
Int. Cl. B01j 1/10
U.S. Cl. 204—158 R 7 Claims

1. A process for introducing a hydroxymethyl group at the C-11α-position in 8R-9-keto-15α-hydroxyprosta-5-cis, 10, 13-trans-trienoic acid methyl ester or its racemate, which comprises irradiating said PGA_2 methyl ester compound in dilute methanol solution in the presence of a sensitizing agent, at a wavelength of about 320 to 400 μ, for a period of time of the order of 4 to 10 hours under an inert atmosphere, thereby yielding 8R-9-keto-11α-hdyroxymethyl-15α-hydroxyprosta-5-cis, 13-trans-dienoic acid methyl ester or the racemic compound thereof.

3,871,980
METHOD FOR IMPROVING THE WETTABILITY OF A SHEET MATERIAL

Louis M. Butcher, Jr., New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 12, 1972, Ser. No. 296,822
Int. Cl. B01k *1/00*
U.S. Cl. 204—164 **6 Claims**

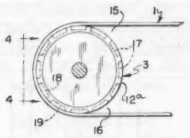
1. A method of treating the surface of a substrate of sheet metal material in a treater assembly to improve the wettability thereof, the assembly including a pair of electrodes having conductive portions connected in circuit with a source of electrical energy, and wherein one electrode has its conductive portion covered by non-conductive material, said method comprising the steps of,

moving said substrate into engagement with said treater assembly,

supporting said substrate in spaced relation from said conductive portion of said one electrode by supporting said substrate in contact with said non-conductive material,

maintaining an air space between said substrate and said one electrode in the area of contact therebetween by supporting said substrate in contact with a cavitated portion of said non-conductive material

supporting said substrate in contact with said conductive portion of said other electrode,



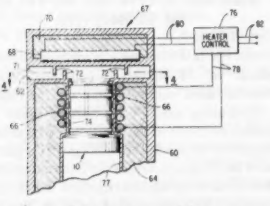
creating a potential difference between said substrate and said conductive portion of said one electrode by establishing a potential difference between said conductive portion of said one electrode and said conductive portion of said other electrode sufficient to cause ionization of the air in the cavities forming said cavitated portion of said non-conductive material for electrostatically treating the surface of said substrate confronting said cavities over the area supported in contact with said cavitated portion of said non-conductive material, and

insulating said conductive portion of said one electrode from said substrate by separating said cavitated portion of said non-conductive material from said conductive portion of said one electrode with a non-cavitated portion of said non-conductive material having a dielectric strength sufficient to prevent arcing between said substrate and said conductive portion of said one electrode while applying said ionizing potential difference therebetween.

3,871,981
IN-SITU OXYGEN DETECTOR

Louis R. Flais, and Ralph G. Gentle, both of Alliance, Ohio, assignors to Bailey Meter Company, Wickliffe, Ohio

Division of Ser. No. 176,804, Sept. 1, 1971, Pat. No. 3,767,469. This application July 2, 1973, Ser. No. 376,053
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 S **6 Claims**



1. An in-situ oxygen detector comprising

an electrolyte tube of zirconium - oxide formed so as to have one end open and one end closed;

a first porous platinum electrode strip bonded to the outside of said tube, extending partially across the closed end and continuing along the side of said tube to a first contact terminal on the outside of said tube;

a second porous platinum electrode strip bonded to the inside of said tube, extending partially across the closed end of said tube so as to overlap said first electrode and continuing along the inside, over the open end and partially on the outside of said tube to a second contact terminal on the outside of said tube;

means sealing the open end of said tube including a zirconia cap;

a self-contained reference atmosphere sealed inside said tube by said sealing means;

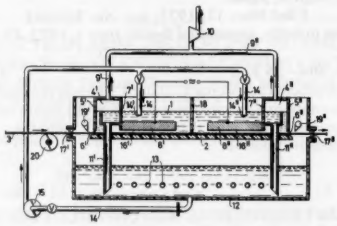
a first thermocouple located on the outside closed end of said electrolyte tube so as to detect the temperature of said first electrode; and

a second thermocouple located on the inside closed end of said electrolyte tube so as to detect the temperature of said second electrode.

3,871,982
APPARATUS FOR TREATMENT OF METAL STRIP WITH A LIQUID

Walter Idstein, Oestrich/Rhine, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed July 11, 1973, Ser. No. 378,079
Claims priority, application Germany, July 13, 1972, 2234424
Int. Cl. B01k *3/00;* **B08b** *3/00;* **C23b** *5/68*
U.S. Cl. 204—207 **9 Claims**



1. An apparatus for the treatment of metal strip with a liquid, comprising, at least one tank provided with an inlet and an outlet for the strip, which inlet and outlet are below the level of the liquid surface in operation, which tank comprises at least one treatment chamber through which the strip is adapted to pass,

a reserve chamber,

means for transporting liquid from the reserve chamber to the treatment chamber, and

two bell chamber means, one close to the inlet and the other close to the outlet, each bell chamber means having an overflow means for liquid to the reserve chamber and each bell chamber means being so constructed that, in operation, the space above the liquid surface is isolated from the ambient atmosphere and is in communication with pressure-reducing means.

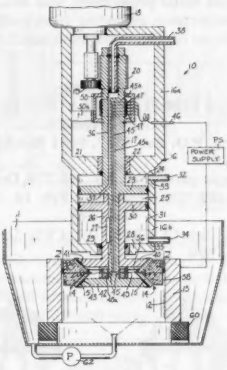
3,871,983
SURFACE FINISHING AND PLATING APPARATUS

John D. Watts, 2 Mohawk Dr., Clinton, Conn. 06413

Filed July 31, 1972, Ser. No. 276,882
Int. Cl. C23b *5/72;* **B01k** *3/04*
U.S. Cl. 204—209 **18 Claims**

1. Apparatus for operating upon the surface of a workpiece comprising an anode tool having a plurality of non-conductive particles bound in and uniformly distributed through at least one electrically conductive body, means for moving said tool with respect to the surface of a workpiece such that the non-conductive particles engage said surface, and space said sur-

face from said conductive body, means supplying an electrolytic solution between said body and the surface, and means



for applying a positive electric potential to said body with respect to an electrical potential applied to said workpiece.

3,871,984

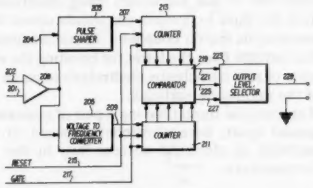
TRANSMISSION OF POT LINE CONTROL SIGNALS

James Simmons Berry, Jr., Savannah, Tenn., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sept. 17, 1973, Ser. No. 398,287

Int. Cl. B01k *3/00;* **C22d** *3/02*

U.S. Cl. 204—228 **14 Claims**



1. A system for controlling a plurality of alumina reduction cells each including a plurality of anodes, said system including:

data processor means for issuing address codes and function codes;

a plurality of sensor means for sensing the stem voltages of the anodes in each of said cells, there being one group of sensor means for each of said cells;

ground detector means;

a ground detector bus connected to said ground detector means; and

a plurality of addressable multiplexers, one for each cell, said multiplexers each including means responsive to address and function codes from said data processor for selectively connecting one of said sensor means in one of said groups to said ground detector bus.

3,871,985

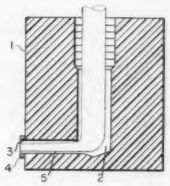
LUGGIN TIP BLOCK ASSEMBLY AND USE IN ELECTROLYTIC CELLS

Monte D. Crippen, and Bernardus J. Mentz, both of North Vancouver, British Columbia, Canada, assignors to Hooker Chemical & Plastics Corp., Niagara Falls, N.Y.

Filed June 25, 1973, Ser. No. 373,215

Int. Cl. G01n *27/30;* **B01k** *3/02;* **C23b** *5/72*

U.S. Cl. 204—231 **6 Claims**



1. Apparatus for use in the determination of half-cell voltages of operating electrodes which apparatus consists essentially of a block of non-conductive material having at least one passageway therein, which passageway consists essentially of a first channel and a second channel, said first channel, at one end extending through one wall of said block and, at the opposite end, terminating within said block in communication with one end of said second channel, said second channel being disposed at a substantially right angle to said first channel, one end of said second channel being in communication with the end of said first channel which terminates within said block and the opposite end of said second channel extending through a wall of said block and terminating in a collar which surrounds the said end of the channel and projects beyond the surface of the said wall of the block, a Luggin Tubulus disposed in said first and second channels, said Tubulus conforming substantially to the dimensions and configurations of said channels, the tip of said Tubulus terminating at the outer surface of said collar and the opposite end of said Tubulus extending beyond the wall of said block through which said first channel extends and being connected to potentiometric means for measuring electrical potential differences.

5. An electrochemical cell comprising a housing, a cathode, an anode and a porous diaphragm separating said cathode and said anode, said anode having secured thereto at least one apparatus as described in claim **1.**

3,871,986

JOINT RAMMING CEMENT FOR ELECTROLYTIC REDUCTION CELL CATHODES

Herbert K. Reamey, and Jerry F. Newman, both of Hot Springs, Ark., assignors to Reynolds Metals Company, Richmond, Va.

Filed Oct. 31, 1973, Ser. No. 411,537

Int. Cl. C22d *3/02;* **B01k** *3/08;* **H01b** *1/04*

U.S. Cl. 204—243 R **5 Claims**

1. Process for forming the cathode lining of an electrolytic cell, said lining being made up of adjacent carbonaceous blocks having joint spaces therebetween, comprising the steps of introducing into said joint spaces a ramming cement comprising a mixture of pitch and a carbonaceous aggregate, at a temperature sufficient to maintain suitable consistency for compacting the cement in said spaces, and then baking the blocks and cemented joints at a temperature and for a period of time sufficient to carbonize the cement and to form a continuous lining structure, said mixture containing from about 13 to about 16.5% by weight of petroleum pitch characterized by having a cube-in-water softening point between about 40° and about 85°C. and having a content of material insoluble in quinoline not greater than about 1%.

3,871,987

APPARATUS FOR REMOVING ACID GAS FROM WASTE GAS

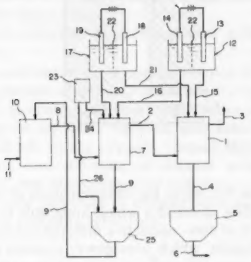
Tsuneo Hasegawa, Shimouchikahara-cho, 46-banchi, Koyama, Kita-ku, Kyoto-shi, 603 Koyoto-fu, and Kiyoharu Nakahara, Gakuendaiwa-cho, 5-chome, 631 Nara-shi, both of Japan

Filed Feb. 14, 1974, Ser. No. 442,455

Claims priority, application Japan, Feb. 16, 1973, 48-19460; Feb. 17, 1973, 48-19466; Feb. 17, 1973, 48-19467; Feb. 19, 1973, 48-20372

Int. Cl. C22d *1/02*

U.S. Cl. 204—263 8 Claims



1. An apparatus for removing acid gas from waste gas comprising:

a first reactor for reacting the form a gas with an alkaline solution of aluminic acid to form a reaction product of the acid gas and aluminum, the first reactor being connected to first conduit means for introducing the waste gas into the reactor, second conduit means for discharging the waste gas after the acid gas has been removed therefrom and third conduit means for discharging the reaction product from the reactor,

a first electrolysis device having an aluminum cathode to convert electrolyte in a cathode zone to an alkaline solution of aluminic acid as electrolysis proceeds, and fourth conduit means for introducing into the first reactor the alkaline aluminic acid solution produced in the first electrolysis device.

3,871,988

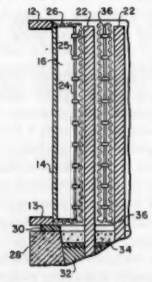
CATHODE STRUCTURE FOR ELECTROLYTIC CELL

Cyril J. Harke, Burnaby, British Columbia, and Monte D. Crippen, North Vancouver, British Columbia, both of Canada, assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed July 5, 1973, Ser. No. 376,782

Int. Cl. B01k *3/04*

U.S. Cl. 204—284 8 Claims



1. A cathode structure for a diaphragm type electrolytic cell comprising a conductive metal enclosure having positioned therein a foraminous metal chamber, said chamber having in communication therewith a plurality of foraminous metal projections, said foraminous metal projections being substantially rectangular in cross section and including therein reinforcing means which comprise a substantially planar metal sheet extending substantially throughout the inner portion of said foraminous metal projections, said metal sheet having a plurality of projections extending from each side thereof to the inner surfaces of said foraminous metal projection.

3,871,989

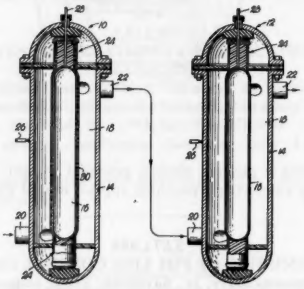
APPARATUS FOR FLOCCULATION OF DISSOLVED SUBSTANCES

Arthur S. King, P.O. Box 5337, 9001 Rosehill Rd., Leawood, Kans. 66215

Continuation-in-part of Ser. No. 298,278, Oct. 17, 1972, Pat. No. 3,801,482. This application Feb. 14, 1974, Ser. No. 442,495

Int. Cl. C02b *1/82*; C02c *5/12*

U.S. Cl. 204—299 9 Claims



1. Apparatus for electrically treating fluids including:

an electrostatic treater having a pair of spaced apart, oppositely charged electrodes for subjecting a fluid passed therebetween to an electrostatic field to neutralize particles contained within the fluid and initiate nucleation,

at least one of said electrodes being electrically insulated from the fluid to prevent electrical current flow; and

an electrolytic treater coupled with said electrostatic treater downstream from the latter for boosting the rate of nucleation of said particles by electrolysis to cause flocculation of the nucleating particles,

said electrolytic treater having a pair of oppositely charged, spaced apart, bare electrodes exposed to the fluid to establish an electrical current flow in the fluid passed therebetween.

3,871,990

ELECTROOSMOTIC OSMOMETER

Albert F. Hadermann, Rt. 1, Ijamsville, Md. 21754; Paul F. Waters, 3318 45th St., N.W., Washington, D.C. 20016, and Jung Woo Woo, 2008 N. Adams, Arlington, Va.

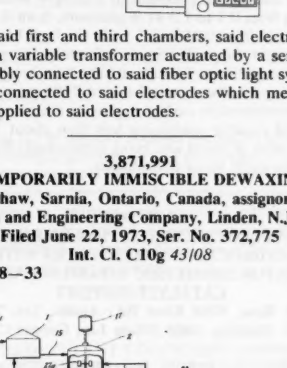
Filed Oct. 15, 1973, Ser. No. 406,268

Int. Cl. B01d *13/02*

U.S. Cl. 204—301 4 Claims

1. An electroosmotic osmometer which comprises in combination a housing containing a solution chamber, a solvent chamber adjacent to said solution chamber and separated therefrom by a semi-permeable membrane, a sensor chamber connected to said solvent chamber, said sensor chamber separated into two sections by an impermeable membrane, an opaque knife edge positioned adjacent to said impermeable membrane in said second section, and movable by movement of said impermeable membrane, a fiber optic light system sensitive to movement of said knife edge, an electroosmotic pressure source containing three chambers said first chamber

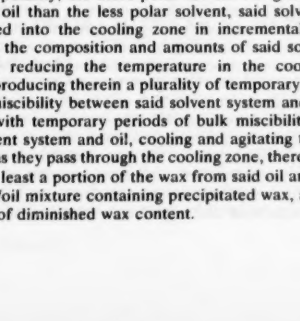
connected to said second section of said sensor chamber, a porous membrane separating said first chamber from said second chamber, a second porous membrane separating said second chamber from said third chamber, electrodes positioned in said first and third chambers, said electrodes connected to a variable transformer actuated by a servomechanism operably connected to said fiber optic light system, and voltmeter connected to said electrodes which measures the potential applied to said electrodes.



3,871,991
TEMPORARILY IMMISCIBLE DEWAXING

David H. Shaw, Sarnia, Ontario, Canada, assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed June 22, 1973, Ser. No. 372,775
Int. Cl. C10g 43/08
U.S. Cl. 208—33 24 Claims

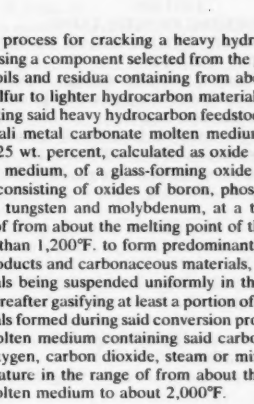


1. A process for separating wax from a waxy petroleum oil stock comprising the steps of introducing said oil stock, at a temperature above its cloud point, into a cooling zone, said oil containing at least a portion of the wax dissolved therein, contacting said oil as it passes through the cooling zone with a dewaxing solvent system comprising two or more solvents of differing polarity, the more polar solvent being less miscible with the oil than the less polar solvent, said solvents being introduced into the cooling zone in incremental amounts, adjusting the composition and amounts of said solvents and gradually reducing the temperature in the cooling zone, thereby producing therein a plurality of temporary periods of bulk immiscibility between said solvent system and oil interspersed with temporary periods of bulk miscibility between said solvent system and oil, cooling and agitating the oil and solvents as they pass through the cooling zone, thereby precipitating at least a portion of the wax from said oil and forming a solvent/oil mixture containing precipitated wax, and recovering oil of diminished wax content.

3,871,992
VISBREAKING A HEAVY HYDROCARBON FEEDSTOCK IN A REGENERABLE MOLTEN MEDIUM

Lawrence F. King, R.R. No. 1, Moorestown, Ontario; Noel J. Gaspar, 562 Cathcart Blvd., Sarnia, Ontario, and Israel S. Pasternak, 579 Highbury Park, Sarnia, Ontario, all of Canada

Filed Mar. 28, 1973, Ser. No. 345,540
Int. Cl. C10g 9/34
U.S. Cl. 208—125 11 Claims



1. A process for cracking a heavy hydrocarbon feedstock comprising a component selected from the group consisting of crude oils and residua containing from about 2 to 6 wt. percent sulfur to lighter hydrocarbon materials which comprises contacting said heavy hydrocarbon feedstock with a regenerable alkali metal carbonate molten medium containing from 0.1 to 25 wt. percent, calculated as oxide and based on total molten medium, of a glass-forming oxide selected from the group consisting of oxides of boron, phosphorus, vanadium, silicon, tungsten and molybdenum, at a temperature in the range of from about the melting point of the molten medium to less than 1,200°F. to form predominantly liquid hydrocarbon products and carbonaceous materials, said carbonaceous materials being suspended uniformly in the molten medium, and thereafter gasifying at least a portion of said carbonaceous materials formed during said conversion process by contacting said molten medium containing said carbonaceous materials with oxygen, carbon dioxide, steam or mixtures thereof at a temperature in the range of from about the melting point of said molten medium to about 2,000°F.

RJB
JBP

3,871,993
UPGRADING THE OCTANE VALUE OF NAPHTHA EMPLOYING A CRYSTALLINE ALUMINOSILICATE ZEOLITE WHICH HAS A HIGH SILICA TO ALUMINA RATIO WHEREIN ALUMINA IS INCORPORATED IN THE INTERSTICES OF THE ZEOLITE CRYSTAL

Roger A. Morrison, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,104
Int. Cl. C10g 35/06
U.S. Cl. 208—135 7 Claims

1. In the process of upgrading the octane value of naphtha having a clear research octane number of up to about 65 by converting such at elevated temperature in contact with an aromatization improving modified synthetic crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12, a constraint index of about 1 to 12, and a crystal density of not substantially less than about 1.6 grams per cubic centimeter; the improvement, whereby increasing the production of saturated $C_3 - C_4$ LPG while maintaining production of higher octane gasoline having a clear research octane number of at least about 85, which comprises contacting said naphtha with said zeolite catalyst having aluminum incorporated into the interstices of the zeolite crystal about 600° to 750°F in the absence of added hydrogen at a space velocity of up to about 15 WHSV.

3,871,994

AROMATIZATION PROCESS

Samuel J. Tauster, 10 Galahad Dr., Englishtown, and John H. Sinfelt, 296 Chaucer Dr., Berkley Heights, both of N.J.

Division of Ser. No. 79,665, Oct. 9, 1970, Pat. No. 3,769,238, which is a continuation-in-part of Ser. No. 724,589, April 26, 1968, abandoned. This application May 15, 1973, Ser. No. 360,441

Int. Cl. C10g *35/06, 35/04*

U.S. Cl. 208—137 11 Claims

9. A process for upgrading a naphtha boiling in the motor fuel range to increase the aromatics content and decrease the amount of paraffins, which comprises contacting said naphtha at aromatization conditions with a catalyst comprising (a) a catalytically active material comprising a compound having the formula

$$M_2Mo_3O_8$$

where M is a divalent metal having an ionic radius not greater than 0.95 A and (b) a support comprising deacidified alumina in which said deacidified alumina comprises alumina and a minor amount of a metal oxide selected from the group consisting of Group I-A metal oxides and Group II-A metal oxides.

3,871,995

REFORMING PROCESS USING PLATINUM-INDIUM-THALLIUM OR INDIUM CATALYST

Pierre Duhaut, LeVesinet, and Jean Miquel, Paris, both of France, assignors to Societe Francaise Des Produits Pour Catalyse, Rueil-Malmaison, France

Division of Ser. No. 267,946, June 30, 1972, Pat. No. 3,793,232. This application Nov. 1, 1973, Ser. No. 412,035

Claims priority, application France, July 5, 1971, 71.24567

Int. Cl. C10g *35/06*

U.S. Cl. 208—138 9 Claims

1. A catalytic reforming process comprising the step of passing hydrocarbons at elevated temperatures in contact with a catalyst,

the improvement comprising employing as said catalyst a catalyst containing:

a. alumina

b. from 0.005 to 1 percent by weight of platinum with respect to the alumina

c. from 0.005 to 1 percent of iridium by weight with respect to the alumina

d. from 0.05 to 3 percent by weight, with respect to the alumina, of a metal selected from the group consisting of thallium and indium.

3,871,996

REFORMING WITH A SINGLE PLATINUM GROUP METAL

John Henry Sinfelt, Berkeley Heights, N.J., assignor to Exxon Research & Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 41,613, May 28, 1970, Pat. No. 3,684,693. This application Aug. 14, 1972, Ser. No. 280,253

Int. Cl. C10g *35/08*

U.S. Cl. 208—139 26 Claims

1. A naphtha reforming process which comprises contacting a hydrocarbon material, under reforming conditions, and in the presence of hydrogen with a catalyst consisting essentially of a refractory support in association with greater than 0.1 wt. percent, based on total catalyst, of a single catalyst metal selected from the group consisting of iridium, ruthenium and osmium, the surface area of said catalyst metal on said support being at least 150 square meters per gram of catalyst metal as determined by carbon monoxide chemisorption techniques, said catalyst being prepared by a procedure comprising (a) contacting said support with a solution of a decomposable compound of said catalyst metal, (b) drying said metal containing support, (c) calcining said metal containing support at conditions that inhibit the formation of crystalline metal oxides, and (d) reducing said catalyst metal compound, said catalyst metal not being present on said support in a crystalline oxide form immediately prior to said reduction.

3,871,997

NOVEL HYDROCARBON CONVERSION CATALYST AND REFORMING USE THEREOF

John H. Sinfelt, Berkeley Heights; Allan E. Barnett, Westfield, and James L. Carter, Chatham, all of N.J., assignors to Exxon Research & Engineering Company, Linden, N.J.

Filed July 19, 1973, Ser. No. 380,833

Int. Cl. C10g *35/08*; B01j *11/78, 11/08*

U.S. Cl. 208—139 7 Claims

3. A hydrocarbon reforming process which comprises contacting a normally liquid hydrocarbon material at reforming conditions and in the presence of hydrogen with a catalyst comprising from 0.1 to 1.0 wt % platinum, from 0.1 to 1.0 wt % iridium and from 0.05 to 0.5 wt % rhodium based on total catalyst weight supported on a refractory inorganic oxide support, said platinum, iridium and rhodium being present as metals having a surface area of at least 200 square meters per gram as determined by carbon monoxide chemisorption techniques, said catalyst containing less than about 2 atoms of sulfur per atom of metal and being substantially free of alkali and alkaline earth metal constituents.

3,871,998

HYDRODESULFURIZATION OF HEAVY HYDROCARBON FEEDSTOCKS WITH NONSTOICHIOMETRIC TITANIUM CARBIDE CATALYST SUPPORT

Howard F. Rase, 3700 River Rd., Austin, Tex. 78703, and Larry A. Maddox, 4426 Sutton Ln., Corpus Christi, Tex. 78411

Division of Ser. No. 212,376, Dec. 27, 1971,. This application Oct. 15, 1973, Ser. No. 406,165

Int. Cl. C10g *23/02, 23/04*

U.S. Cl. 208—216 4 Claims

1. A process for the hydrodesulfurization of a sulfur-containing heavy hydrocarbon feedstock boiling above about 650°F. which comprises contacting said feedstock with hydrogen and a catalyst composite comprising from about 0.1 to about 25 weight percent of said composite of a hydrogenation component selected from the group consisting of a metal, metal oxide, metal sulfide, or mixtures thereof, selected from Group VI-B, Group VIII or mixture of said Groups of the Periodic Chart of the Elements and titanium carbide base characterized as a stable phase solid of stoichiometry ranging from $TiC_{0.52}$ to $TiC_{0.99}$.

3,871,999

REMOVAL OF POLLUTANTS FROM WASTE-WATER

Wilbur N. Torpey, Douglaston, N.Y., assignor to Autotrol Corporation, Milwaukee, Wis.

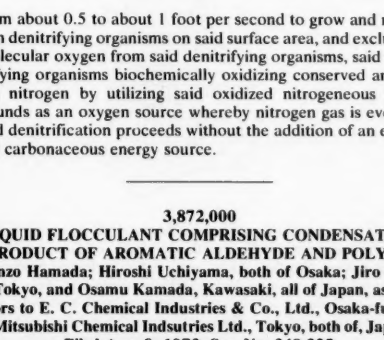
Continuation-in-part of Ser. No. 338,355, March 5, 1973, abandoned. This application Jan. 31, 1974, Ser. No. 438,414

Int. Cl. C02c *1/02*

U.S. Cl. 210—16 12 Claims

1. A method for treating wastewater including at least about 10 mg/liter of ammonia nitrogen and at least about 100 mg/liter of carbonaceous pollutants, expressed as BOD_5, comprising the steps of supplying said wastewater to a first biological treatment unit, biochemically oxidizing from about 85 to 95% BOD_5 in said first biological treatment unit, biochemically oxidizing at least about 20% and less than about 50% of said ammonia nitrogen in said first biological treatment unit to form oxidized nitrogenous compounds while conserving at least 50% of said ammonia nitrogen, supplying wastewater effluent from said first biological treatment unit to a second biological treatment unit a predetermined rate, said second biological treatment unit including a plurality of rotatable

contactors having surface area for the growth and maintenance of denitrifying organisms, said predetermined rate being from about 1 to about 4 gallons per day per square foot of said surface area, said contactors being at least partially submerged in said wastewater, said wastewater having a temperature from about 53°F. to about 80° F. and a pH from about 6 to about 8 in said second biological treatment unit, rotating said contactors in said wastewater at a peripheral velocity



from about 0.5 to about 1 foot per second to grow and maintain denitrifying organisms on said surface area, and excluding molecular oxygen from said denitrifying organisms, said denitrifying organisms biochemically oxidizing conserved ammonia nitrogen by utilizing said oxidized nitrogeneous compounds as an oxygen source whereby nitrogen gas is evolved and denitrification proceeds without the addition of an external carbonaceous energy source.

3,872,000

LIQUID FLOCCULANT COMPRISING CONDENSATION PRODUCT OF AROMATIC ALDEHYDE AND POLYOL

Kenzo Hamada; Hiroshi Uchiyama, both of Osaka; Jiro Sugi, Tokyo, and Osamu Kamada, Kawasaki, all of Japan, assignors to E. C. Chemical Industries & Co., Ltd., Osaka-fu and Mitsubishi Chemical Indsutries Ltd., Tokyo, both of, Japan

Filed Apr. 9, 1973, Ser. No. 349,325
Claims priority, application Japan, Apr. 8, 1972, 47-35390
Int. Cl. B01d *21/01;* **C08f** *3/40;* **C08g** *11/00*
U.S. Cl. 210—54 **15 Claims**

1. A method of treating fluid drainage, which comprises:

flocculating said fluid drainage with a filamentous liquid composition consisting essentially of from 5 – 50 parts by weight of a condensation product of an aromatic aldehyde and a polyhydroxy alcohol containing at least four hydroxyl groups, 15 – 50 parts by weight of a surfactant and 15 – 50 parts by weight of a polar organic solvent, all of which are uniformly dispersed in water, such that contaminants are removed from said waste fluid.

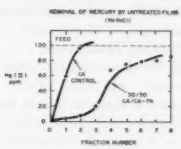
3,872,001

REMOVAL OF HEAVY METAL POLLUTANTS FROM AQUEOUS MEDIA

Howard J. Davis, Warren, N.J., and Leonard A. Lee, Rockville, Md., assignors to Celanese Corporation, New York, N.Y.

Filed May 31, 1973, Ser. No. 365,792
Int. Cl. C02b *1/18*
U.S. Cl. 210—58 **5 Claims**

1. A process for removing pollutant heavy metal cations from an aqueous media containing same which comprises passing said pollutant-containing aqueous media through a substantially water insensitive, flexible base, porous polymeric film thereby forming a complex with the pollutant metal cations to be removed from the aqueous media, said film being prepared from a polymer containing from about 0.01 to 3.0 free hydroxyl groups per gram of polymer which has been reacted with a polyfunctional carboxylic or sulfonic acid or anhydride to produce an acid-containing polymer and subse



quently contacted with a divalent metal chelate which is not subject to water degradation.

3,872,002

PROCESS FOR EXTRACTING PHOSPHATE FROM SOLUTIONS

Ralph E. Musgrove, Midland, Tex., assignor to GeoResources, Inc., Williston, N. Dak.

Filed Mar. 29, 1973, Ser. No. 346,090
Int. Cl. C02c *5/02*
U.S. Cl. 210—59 **12 Claims**

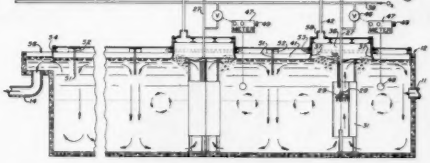
1. A method of extracting water-soluble phosphate contaminants from a solution which comprises intimately blending a water-insoluble humic acid salt selected from the group consisting of iron humate, aluminum humate and mixtures thereof with the solution containing said water-soluble phosphate contaminants, subsequently removing the resulting water-insoluble humate/phosphate solids component from the solution, leaching said humate/phosphate solids component with an alkali solution and separating the resulting regenerated humate separated as solids from the leach solution.

3,872,003

HIGH-OXYGEN TREATMENT OF WASTE WITH SELECTIVE OXYGEN RECIRCULATION

James Donald Walker, Aurora, Ill., assignor to Chicago Bridge & Iron Company, Aurora, Ill.

Filed Sept. 20, 1972, Ser. No. 290,627
Int. Cl. C02b *3/08;* **C02c** *1/10, 5/04*
U.S. Cl. 210—63 **11 Claims**



1. The method of treating waste liquid with gas richer than air in oxygen which includes flowing the waste liquid through a retention tank, maintaining a gas-lift rolling action of the tank contents with the gas-lifted contents forming a horizontal stream flowing away from the gas-lift zone in surface-exposed position by liberating and allowing to rise immediately by buoyancy said gas at submerged locations along selected zones of the tank comprising a small portion of its total horizontal cross section in sufficient quantities to create and maintain said rolling action and thereby cause said contents to carry small entrained bubbles to remote areas, characterized by:

selectively entrapping gas escaping the liquid in the area over said zones where relatively large gas-lift bubbles quickly escape the liquid forming said horizontal stream, and recirculating and enriching said gas by adding sub-

stantially pure oxygen to it, compressing it and liberating it again in the same locations, while substantially excluding from the recirculated gas a significant portion of the gas liberated, namely, such gas from smaller bubbles as escapes the liquid at remote areas beyond the area of selective entrapment.

8. Apparatus for treating waste liquid with gas richer than air in oxygen which includes a retention tank, means for flowing liquid waste through said tank largely with successive passage through successive sections of the tank, a source for supplying substantially pure oxygen, means for releasing gas including gas from said source at submerged locations along selected zones of a plurality of the tank sections, said zones comprising only a small portion of the total horizontal cross section of each section, said means for releasing the gas releasing it at positions from which the gas can rise immediately by buoyancy with gas-lift action, and in sufficient quantities to create rolling action of the tank contents in the section with the gas-lifted contents immediately forming a horizontal stream having its surface exposed to release large bubbles while carrying small entrained bubbles to remote areas, characterized by:

a cover over said zones largely segregating areas where large bubbles escape the stream from more remote areas, selectively entrapping gas escaping the liquid in said areas of large-bubble escape, said apparatus being substantially free of impediment to the rolling action through the region of gas lifting and outward therefrom to beyond the area segregated by said cover, common means for drawing off the entrapped gas and recirculating and compressing said gas from various sections and means for enriching said gas by adding substantially pure oxygen from said source to it separately for each of a plurality of tank sections before it is released again in the same locations; said cover comprising means for substantially excluding from the recirculated gas a significant portion of the gas liberated, namely, such gas from smaller bubbles as escapes the liquid more remotely from the gas-lift area than said areas segregated by said cover; and

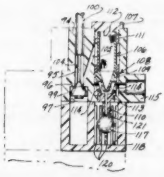
means for regulating the addition of oxygen separately for each of a plurality of sections.

3,872,004

CONTROL UNIT FOR A WATER SOFTENER

Edward C. Grout, and Donald F. Klassy, both of Delavan, Wis., assignors to Sta-Rite Industries, Inc., Delavan, Wis.

Filed Sept. 14, 1972, Ser. No. 288,924
Int. Cl. C02b 1/22
U.S. Cl. 210—127 **21 Claims**



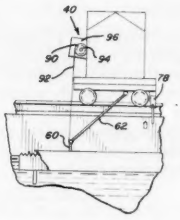
1. In a control unit for a water softener, a tank, a casing mounted on the tank and having a water inlet and a water outlet, a tubular member disposed within the casing and extending downwardly within the tank with the lower portion of the tubular member communicating with the interior of the tank, first port means providing communication between the inlet and the tubular member, a first valve seat located in said tubular member, a main control valve disposed to engage said first valve seat and movable between an open and a closed position, second port means providing communication between the tubular member at a location below said valve seat and the upper end of the tank, third port means located in the tubular member below said second port means and connected with said outlet, check valve means located in the tubular member beneath said third port means, said check valve means disposed to permit flow of water from said tubular member through said third port means to the outlet and disposed to prevent flow of water in the opposite direction, and sealing means for sealing off the tubular member at a location between said second port means and said third port means to prevent direct communication therebetween, when said main control valve is in the open position water entering said inlet passes through said first port means into said tubular member and through said second port means to the interior of the tank, and then upwardly through said tubular member and through said check valve means and said third port means to the outlet.

3,872,005

SKIMMING APPARATUS FOR CLARIFICATION TANKS

Jeffrey A. Baker, Northbrook, Ill., assignor to FMC Corporation, Chicago, Ill.

Filed Oct. 18, 1972, Ser. No. 298,595
Int. Cl. B01d 21/18
U.S. Cl. 210—141 **2 Claims**



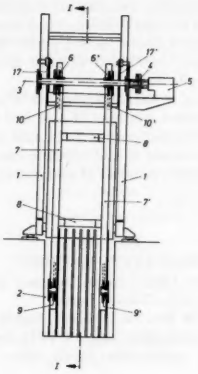
2. In a liquid clarification apparatus including a tank having an inlet for supplying fluid with entrained solids and an outlet for receiving clarified liquid, said outlet including a plurality of transversely spaced longitudinally extending weir boxes, said weir boxes each having a bottom wall and side walls having upper edges defining the liquid level for said tank; baffle structure surrounding each weir box, said baffle structure having upper and lower edges respectively located above and below said upper edges; a traveling bridge above said tank; drive means for reciprocating said bridge between extreme positions parallel to said longitudinally extending weir boxes; and skimming means depending from said bridge for removing scum from the surface of said liquid, said skimming means including an elongated blade extending transversely of said tank, said blade having recesses aligned with said weir boxes and extending from the lower edge of said blade, said recesses allowing the lower edge of the blade to be below the liquid level while the bridge is in the weir box area of the tank; power means for raising and lowering said blade on said bridge, said power means defining a first skimming position for said blade where the lower edge of the blade is located below the liquid level and the bases of the recesses are above said upper edges of said side walls when said bridge is traveling in one direction in the weir box area of the tank, said power means defining a second skimming position for said blade wherein the recesses and the lower edge of said blade are located below said upper edges of said side walls while the blade is located in the area of the tank between the weir boxes and the inlet end, said power means defining a third inoperative position for said blade where the lower edge of said blade is located above said upper edges of said side wall; said power means including a shaft rotatable on said bridge, drum means fixed to said shaft, cable means between said drum means and said blade, reversible drive means connected to said shaft; switch means cooperating with said drive means and carried by said bridge; and actuating means for actuating said switch means when said bridge is at opposite ends of said tank and at inner ends of said weir boxes to operate said drive means and move said blade between said positions.

3,872,006

APPARATUS FOR TAKING FLOATING AND SOLID MATERIALS OUT OF CHANNELS

Gunther Abel, 10 Benzstrasse, 79 Ulm, Germany

Filed Aug. 27, 1973, Ser. No. 392,115
Int. Cl. B01d 35/28
U.S. Cl. 210—158 14 Claims



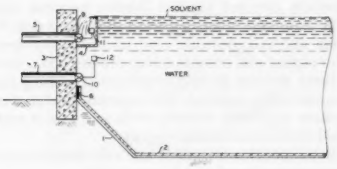
1. Apparatus for removing floating and solid materials from a channel, said apparatus comprising a support frame; a first vertically inclined member supported by the support frame; said first vertically inclined member including a lower portion comprising a liquid-transmissible grate for extending to the bottom of the channel and further including an adjoining upper portion comprising a conveyer chute leading to a discharge outlet; a drive shaft supported at opposite end portions thereof above the conveyer chute by the support frame; spaced second and third vertically inclined members comprising opposite side walls for the liquid-transmissible grate and adjoining conveyer chute; each of said side walls being supported at the upper end portion thereof by the drive shaft for pivotal movement about the longitudinal axis of the drive shaft independently of the other side wall; first and second pairs of spaced sprockets; each of said first pair of spaced sprockets being operatively connected to the drive shaft adjacent to the upper end portion of an associated different one of the side walls; each of said second pair of spaced sprockets being supported at the lower end portion of an associated different one of the side walls; a pair of spaced endless elevator chains supporting a plurality of successively arranged blades adjacent to the liquid-transmissible grate and adjoining conveyer chute; each of said conveyer chains being supported in operative engagement with the sprockets supported at the upper and lower end portions of an associated different one of the side walls to guide the blades supported by the elevator chains along the transmissible grate and adjoining conveyer chute and thereby permit removal of floating and solid materials from the channel; whereby the side walls and, hence, the elevator chains may be independently displaced at different angles relative to the liquid-transmissible grate and adjoining conveyer chute to facilitate removal of floating and solid materials from the channel.

3,872,007

CONTAINER FOR PLURALITY OF IMMISCIBLE LIQUIDS

Floyd H. Holland, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 29, 1972, Ser. No. 310,449
Int. Cl. E02b 3/16
U.S. Cl. 210—170 1 Claim



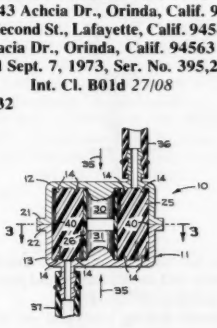
1. A reservoir for storing two immiscible liquids of different densities which comprises a walled-in space, said space containing therein a liner composed of a material selected from the group consisting of asphalt, plastic, or rubbery material which is sensitive to the solvent effects of the lighter liquid, and surrounding the top of said space an impervious wall that is resistant to the solvent effects of said liquid, the lower portion of said wall and the upper portion of said liner being attached in sealing engagement, said wall containing at a point above the liner a first valved conduit outlet means combined with a first liquid level sensing means which allows removal of the heavier liquid in response to the liquid level sensing means such that the level of the heavier liquid is maintained at a chosen level above the outlet means, said wall further containing a weir means located above said first outlet conduit means, said weir means and said impervious wall defining an overflow area containing a second liquid level sensing means being constructed and arranged to control a second valved conduit outlet means such that at least the lighter liquid can be removed from the reservoir.

3,872,008

DISPOSABLE FILTER UNIT

Wilbur W. Lee, 43 Achcia Dr., Orinda, Calif. 94563; William A. Lee, 1024 Second St., Lafayette, Calif. 94549, and Robert D. Lee, 43 Acacia Dr., Orinda, Calif. 94563

Filed Sept. 7, 1973, Ser. No. 395,271
Int. Cl. B01d 27/08
U.S. Cl. 210—232 1 Claim



1. A fluid filter comprising:

a. a housing having confronting generally cup-shaped sections, said cup-shaped sections being arranged for sealing juncture at their lips;

b. a roll of compressible material disposed within said housing, said roll of compressible material having an axial length slightly greater than the inner axial dimension of said housing and having a radius of a dimension to fit tightly within said housing, the movement of said cup-shaped sections toward one another in the axial direction compresses said roll of compressible material axially causing said roll of compressible material to be compressed radially through said housing.

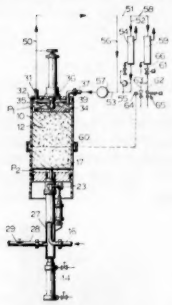
c. said lips of said cup-shaped sections being fixedly sealed together and to said roll of compressible material to reduce fluid by-passing said roll of compressible material,
d. said housing being formed with annular rings on the inner end walls thereof for additionally compressing said roll of compressible material to reduce fluid by-passing said roll of compressible material,
e. said roll of compressible material being wound on a compressible core;
f. oppositely directed tapered tubular sections disposed axially from said inner end walls of said housing for receiving said compressible core telescopically thereover and to engage said compressible core to exert a compressive force thereon for reducing fluid by-passing said roll of compressible material, said tapered tubular members terminate in spaced relation when said lips of said cup-shaped sections are sealed together;
g. an inlet connector on one of said cup-shaped sections at the upstream side of said housing; and
h. an outlet connector on the other of said cup-shaped sections at the downstream side of said housing, whereby the fluid enters said housing at said inlet connector, flows through said roll of compressible material and is discharged from said housing through said outlet connector.

3,872,009

APPARATUS FOR THE SEPARATION AND TREATMENT OF SOLID PARTICLES FROM A LIQUID SUSPENSION

Henricus Alexis Cornelis Thijssen, Rontgenlaan 2, Son, Netherlands

Continuation-in-part of Ser. No. 156,717, June 25, 1971, Pat. No. 3,777,892
Filed Sept. 20, 1973, Ser. No. 399,112
Claims priority, application Netherlands, Sept. 26, 1972, 7212995
Int. Cl. B01d *29/00*
U.S. Cl. 210—178 **18 Claims**



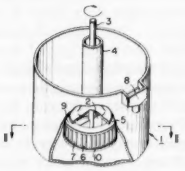
1. Apparatus for the separation and purification of solids from a suspension and for leaching solid particles comprising an impervious column including:
a. piston means closing one end of said column and mounted for reciprocating movement within said column to compact the solid particles to a bed and advance said compacted bed of solid particles to the opposite end of said column during the compression stroke of said reciprocating movement, said piston means including:
i. a surface facing the bed of solid particles;
ii. filtering means on said surface which is selectively permeable for the liquid phase of said suspension;
iii. feeding means in communication with said surface for feeding said suspension into said column, said feeding means including:
a. at least one opening in said surface and
b. at least one conduit in flow communication with said opening;
iv. first discharge means for the removal of said liquid phase of said suspension from said column including at least one conduit in flow communication with said filtering means;
v. valve means in said at least one conduit of said feeding means to pass said suspension to said column only during the suction stroke of said reciprocating movement;
vi. valve means in said at least one conduit of said discharge means to remove said liquid phase of said suspension only during said compression stroke of said reciprocating movement;
vii. a pressure applicator in communication with said first discharge means before said valve means in said at least one conduit of said first discharge means including a cylinder with a double acting piston and pressure applying means connected thereto for actuating said pressure applicator; and
b. treating means at the opposite end of said column for treating successive portions of said bed to facilitate removal of the treated portion from said column and second discharge means at said opposite end of said column for the progressive removal of said successive portions of said bed.

3,872,010

FLOTATION MACHINE

Tatsuya Nagahama, Tokyo, Japan, assignor to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 341,269, March 14, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,501
Claims priority, application Japan, Mar. 18, 1972, 47-27601
Int. Cl. B03d *1/24*
U.S. Cl. 210—219 **1 Claim**



1. A froth flotation machine comprising a flotation cell having an air inlet pipe for introducing air into the flotation liquid close to the bottom of the cell, froth removal means for removing froth from the upper end of the cell, a rotatable impeller disposed close to the bottom of the cell for mixing the flotation liquid with the air supplied by the pipe and circulating the mixture along the bottom of the cell, an annular stationary dispersing unit mounted on the lower end of said air inlet pipe and adjacent to the bottom wall of the cell, said impeller being disposed within the central opening of said dispersing unit and said dispersing unit being coaxial with the axis of rotation of said impeller, said dispersing unit comprising two coaxial, vertically spaced, imperforate, annular supports, a series of substantially uniformly spaced guide vanes mounted on and extending between said supports and located in the path of flow of said mixture from said impeller and being forwardly curved in the direction of rotation of the impeller for directing the liquid in a direction substantially tangential to the side wall of the cell and substantially parallel to the bottom wall of the cell, with the radially outer edge of each guide vane being positioned forwardly of its radially inner edge in the direction of rotation of said impeller, each pair of adjacent guide vanes defining a discharge passage for said mixture, said discharge passage having an inlet at the radially inner end thereof and an outlet at the radially outer end thereof, said outer edge of each guide vane also being

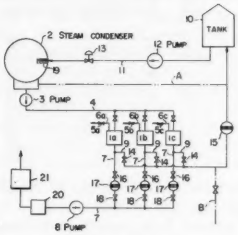
positioned circumferentially forwardly of said inner edge of the adjacent leading guide vane in the direction of rotation of said impeller, the entirety of the outlet of each discharge passage being disposed circumferentially forwardly of the entirety of the inlet of the same discharge passage in the direction of rotation of said impeller, and the radially outer edge of said upper annular support is located substantially at and directly above the outer edges of said guide vanes.

3,872,011

CONDENSED WATER DECHLORINATION APPARATUS

Tsugutomo Teranishi, and Osami Takita, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 190,601, Oct. 19, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,532
Claims priority, application Japan, Oct. 21, 1970, 45-92053
Int. Cl. B01d *23/10*
U.S. Cl. 210—269 **18 Claims**



1. Condensed water dechlorination apparatus comprising:

a steam condenser maintained at a negative pressure;

boiler means for producing steam;

first conduit means for passing water produced in said condenser to said boiler means;

means for returning steam produced in said boiler means to said steam condenser;

a water supply tank for supplying make up water to said steam condenser;

a second conduit means fluidly connecting said supply tank to said steam condenser;

a pump in said second conduit means for pumping water from said supply tank to said steam condenser;

a control valve attached to said second conduit means for controlling the flow of water from said supply tank to said steam condenser;

at least one dechlorination water tower including a quantity of resin which must be periodically withdrawn, regenerated and reinserted into said dechlorination tower to remain effective, said dechlorination tower being attached to said first conduit means intermediate said steam condenser and said boiler;

a blow pipe fluidly connected to the downstream side of said dechlorination water tower and in fluid communication with said second conduit upstream of said pump and control valve for passing blow water produced in said dechlorination water tower immediately after regeneration and replacement of said resin therein to said second conduit;

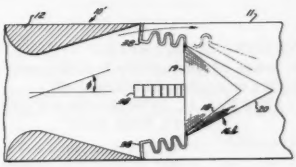
and valve means fluidly connected to said dechlorination water tower for causing the water passing out of said dechlorination water tower to pass through said first conduit means and into said boiler during normal operation of said apparatus and for further causing the water passing out of said dechlorination water tower to pass through said blow pipe immediately after the regenerated resin is reinserted into said dechlorination water tower.

3,872,012

PARTICULATE SEPARATOR

Donald L. Endicott, Garden Grove, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Dec. 20, 1973, Ser. No. 426,791
Int. Cl. B01d *33/00*
U.S. Cl. 210—297 **14 Claims**



1. A separator for removing particulate contamination from a medium flowing in a predetermined direction in a conduit, the medium having a different density than the contamination, the separator including:

venturi means to accelerate the flowing medium to flow in a direction different than said predetermined direction so that the contamination is concentrated in a predetermined downstream area of the flow and to recover the pressure drop caused by the acceleration; and

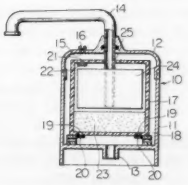
means positioned in said predetermined downstream area of the flow to entrap and retain said particulate contamination, said last named means including a first screen, a second screen of finer mesh than said first screen and downstream therefrom and support means connected to said screens to support said first and second screens in said predetermined downstream area of the flow and spaced from the conduit whereby a primary flow path around said first and second screens is present, said first and second screens being connected together at at least one edge thereof and defining an entrapment zone therebetween in which the particulate is entrapped.

3,872,013

BACTERICIDAL WATER PURIFIER FOR DECHLORINATED WATER

Atsushi Nishino; Yukihide Iura; Masayoshi Kubo, and Motosi Tateisi, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Osaka, Japan

Filed Nov. 8, 1973, Ser. No. 414,133
Claims priority, application Japan, Nov. 9, 1972, 47-112696; Aug. 11, 1973, 48-90385; Aug. 11, 1973, 48-90386
Int. Cl. B01d *31/00*
U.S. Cl. 210—317 **3 Claims**



1. In a water purifier having absorption means to dechlorinate potable water supplied thereto, a filter assembly to filter and sterilize the water, comprising two layers of filter cloth joined with each other to form a space therebetween, a water conduit communicating with said space and with an outlet of the purifier, at least one sheet of a synthetic fiber non-woven cloth having a thickness of 0.01 to 5 mm and coated and

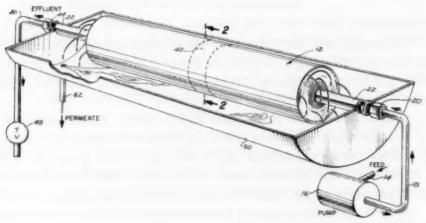
impregnated with a bactericidal substance and arranged in said space to be substantially opposite the entire inner surfaces of said filter cloth layers, and at least one support member having a multiplicity of openings to allow water to flow freely therethrough arranged in said space to prevent said sheet from contacting said filter cloth layers, so that said sheet is exposed to the filtered water and exerts a bactericidal action thereon.

3,872,014

MEMBRANE SEPARATION APPARATUS

William J. Schell, Manhattan Beach, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Mar. 11, 1974, Ser. No. 449,605
Int. Cl. B01d *31/00*
U.S. Cl. 210—232 **20 Claims**



1. A module of a convolute design employing a permselective membrane for use in separating a permeate from a fluid feed mixture, said module comprising:

a generally-hollow mandrel having a wall intermediate its length dividing the mandrel into a first compartment and a second compartment with means for introducing a fluid feed stream to the first compartment of said mandrel and means for removing an effluent fluid stream from the second compartment of the mandrel;

two permselective membranes spaced from each other by a backing to provide a first fluid passageway therebetween; means defining a second fluid passageway for presenting the fluid feed to the two membranes upon the spiral wrapping of said two membranes about the mandrel to form a compact module roll, said second passageway beiing divided into two juxtapositioned regions which two regions at a spaced distance first compartment the mandrel are interconnected to direct flow of the fluid feed from the first region into the second region with said first region being in fluid communication with the firstcompartment of the mandrel to receive the incoming fluid feed and said second region being in fluid communication with the second compartment of the mandrel whence the effluent fluid stream is removed;

means for removal of fluid from the first fluid passageway to exterior of the module; and

means restraining the unspiralling of the compact module roll under operational conditions.

3,872,015

APPARATUS FOR SEPARATING FLUIDS INTO TWO FRACTIONS BY MEANS OF SEMIPERMEABLE MEMBRANES

Rud Erik Madsen, Nakskov, Denmark, assignor to Aktieselskabet De Danske Sukkerfabrikker, Copenhagen, Denmark

Filed Feb. 2, 1973, Ser. No. 329,196
Claims priority, application United Kingdom, Feb. 2, 1972, 4971/72
Int. Cl. B01d *31/00*
U.S. Cl. 210—346 **4 Claims**

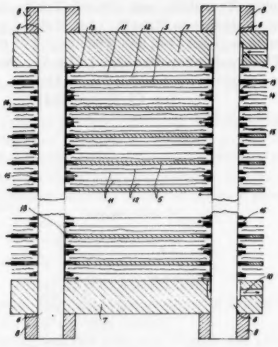
1. Apparatus for separating liquids into two fractions by means of semipermeable membranes, comprising:

a stack of membrane supports, each membrane support supporting at least one semipermeable membrane so as to form a flow passage extending parallel to the membrane surface;

liquid inlet and liquid outlet means communicating with said flow passages;

means for collecting and discharging liquid passing through said membranes; and

means for compressing the stack of membrane supports and membranes, said means for compressing including two spaced bolts connected to end flanges at the end of the



stack, each bolt being inserted in aligned holes in said membrane supports and membranes to form around said bolt an annular flow passage extending longitudinally through said stack and communicating with a plurality of adjacent flow passages extending parallel to the membrane surfaces over which adjacent passages the liquid flows in the same direction, and a plurality of closing means provided at spaced locations in said longitudinal annular flow passages so as to deflect a liquid flow through such a longitudinal annular flow passage into the flow passages extending parallel to the membrane surfaces.

3,872,016

FILTER AID MATERIALS DISPERSIBLE IN ORGANIC LIQUIDS

George Richard Bell, Larkspur, Colo., assignor to Johns-Manville Corporation, Greenwood Village, Colo.

Filed Mar. 25, 1974, Ser. No. 454,532
Int. Cl. B01d *39/00*
U.S. Cl. 210—500 **10 Claims**

1. A filter aid product dispersible in relatively non-polar organic liquids comprising an intimate mixture of a filter aid material and more than 0.1%, based on the weight of the filter aid material, of a surfactant selected from a group consisting of aliphatic and aromatic hydroxypoly (oxyethylene) mixtures of dihydrogen phosphate and monohydrogen phosphate esters containing from about 1 to about 5.5 moles of ethylene oxide per mole of aliphatic or aromatic base.

3,872,017

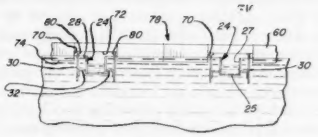
SKIMMING BLADE

Wayne C. Bishop, Doylestown, Pa., assignor to FMC Corporation, Chicago, Ill.

Filed Oct. 18, 1972, Ser. No. 298,506
Int. Cl. B01d *21/00*
U.S. Cl. 210—525 **11 Claims**

1. In a liquid clarification apparatus including a tank having an inlet for supplying fluid with entrained solids and an outlet for receiving clarified liquid, said outlet including a plurality of transversely spaced longitudinally extending weir boxes, each having a bottom wall and side walls, said side walls hav-

ing upper edges defining the liquid level for said tank; a traveling bridge above said tank; drive means for reciprocating said bridge between extreme positions parallel to said longitudinally extending weirs; and skimming means depending from said bridge for removing scum from the surface of said liquid, said skimming means including an elongated blade extending transversely of said tank, said blade having cutouts aligned with said weir boxes in the direction of travel of said bridge, and said cutouts having bases located above the lower edge of said blade and below the upper edge of said blade; and means



maintaining said blade in a first skimming position while said bridge is moving in the area of said weir boxes, a second skimming position below said first skimming position while said blade is in the area of the tank between said inlet and said weir boxes and an inoperative position where said blade is located above said upper edges when said bridge is traveling in an opposite direction, said bases of said cutouts being located above said upper edges in said first skimming position and below said upper edges in said second skimming position while said lower edge of said blade is located below said upper edges in both skimming positions.

3,872,018

WATER LOSS ADDITIVE FOR SEA WATER MUD COMPRISING AN ALKALINE EARTH OXIDE OR HYDROXIDE, STARCH AND POLYVINYL ALCOHOL

Albert H. D. Alexander, Houston, Tex., assignor to Oil Base, Inc., Houston, Tex.

Filed Nov. 15, 1972, Ser. No. 306,856

Int. Cl. C10m *3/16*

U.S. Cl. 252—8.5 A **9 Claims**

1. An aqueous clay-free drilling fluid comprising an alkaline earth oxide or hydroxide dissolved in a brine solution and including starch as a fluid loss control agent, the improvement wherein said composition contains a small amount of polyvinyl alcohol polymer sufficient to maintain desirable fluid loss properties at elevated temperatures.

3,872,019

OIL-SOLUBLE LUBRICANT BI-FUNCTIONAL ADDITIVES FROM MANNICH CONDENSATION PRODUCTS OF OXIDIZED OLEFIN COPOLYMERS, AMINES AND ALDEHYDES

George S. Culbertson, Downers Grove; Gary R. Chipman, Naperville, and Robert E. Karll, Batavia, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 8, 1972, Ser. No. 278,719

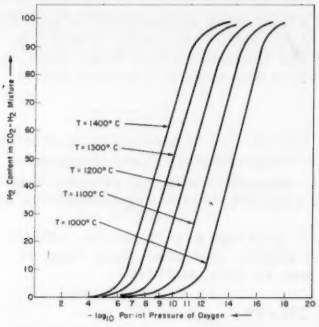
Int. Cl. C08g *9/04*, *37/32*; **C10m** *1/32*

U.S. Cl. 252—51.5 A **13 Claims**

1. The oil-soluble condensation product prepared by the process comprising, reacting simultaneously at a temperature of from about 250°F. to about 350°F. (1) an oxidized high molecular weight amorphous copolymer of essentially ethylene and propylene, said copolymer having a number average molecular weight of at least about 10,000 and at least 140 pendant methyl groups per 1,000 chain carbon atoms, (2) a formaldehyde-yielding reactant and (3) a primary or secondary aliphatic amine selected from the group consisting of an alkyl amine having from about 2 to about 12 carbon atoms, an aliphatic diamine of the general formula $H_2N(CH_2)_yNH_2$ wherein y is an integer of from about 3 to about 10, and a polyalkylene polyamine of the general formula

$$HN-\left(A-N\right)_x H,$$
$$\quad\quad\quad

atoms in the sintered uranium oxide within the range of about 1.98:1 to about 2.10:1, and thereafter cooling the sintered



body in a cooling atmosphere having an oxygen partial pressure in the range of 10^{-4} to 10^{-18} atmospheres of oxygen.

3,872,023

MICROCAPSULES HAVING WALLS MADE OF COPOLYMER OF METHYLMETHACRYLATE AND ACETYLACETATES OF MONO(METH) ACRYLATES OF ALIPHATIC DIOLS

Guenter Baum, Ludwigshafen; Rudolf Bachmann, Frankenthal, and Wolfgang Sliwka, Weinheim, all of Germany, assignors to Badische Anilin- & Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Apr. 17, 1972, Ser. No. 244,929
Int. Cl. B01j *13/02*
U.S. Cl. 252—316 **3 Claims**

1. Microcapsules of which the wall material consists of a copolymer of:

A. from 20 to 50 percent by weight of methyl methacrylate,

B. from 20 to 50 percent by weight of acetylacetates of mono(meth)acrylates of aliphatic diols of from 2 to 8 carbon atoms,

C. from 0 to 30 percent by weight of acrylamide,

D. 0 to 30 percent by weight of acrylic acid,

E. from 0 to 30 percent by weight of vinyl pyrrolidone, and

F. from 0 to 3 percent by weight of 2-sulfoethyl methacrylate; and the core substance includes a solvent or dispersing member selected from the group consisting of castor oil, sperm oil, olive oil, paraffins and waxes, chloroparaffins, chlorinated diphenyl, light naphtha, kerosene, dibutyl phthalate, tricresyl phosphate, benzene, toluene, xylene, ethylhexyl acrylate, n-butyl acrylate, t-butyl acrylate, lauryl acrylate, styrene and other hydrocarbons which are (1) soluble in methylene chloride; (2) substantially insoluble in water; and (3) less volatile than methylene chloride.

3,872,024

ENCAPSULATION PROCESS BY SIMPLE COACERVATION USING INORGANIC POLYMERS

Georg Horger, Steppach, Germany, assignor to NCR Corporation, Dayton, Ohio

Filed May 27, 1970, Ser. No. 41,112
Int. Cl. B01j *13/02*; **B44d** *1/02*
U.S. Cl. 252—316 **2 Claims**

1. In a process for manufacturing minute capsules, en masse, in an aqueous liquid capsule manufacturing vehicle comprising the step of

establishing an agitating three-phase aqueous liquid capsule manufacturing system wherein

i. a major proportion of the system comprises a continuous phase of aqueous liquid,

ii. a minor proportion of the system is a discontinuous phase of minute mobile particles of intended capsule core entities and,

iii. a minor proportion of the system is a discontinuous phase of liquid globules of capsule wall material,

the capsule core entities being wettable by the capsule wall material, the three phases being substantially mutually immiscible, and the liquid globules of capsule wall material being present in sufficient volume to wet and enwrap the capsule core entities and comprising two hydrophilic polymeric materials

the improvement which comprises effecting establishment of the phase including capsule wall material by simple coacervation of poly(vinyl alcohol) concentrated in the capsule-wall-material-containing liquid phase using, as phase-separation-inducing material, an inorganic polymeric material wherein the inorganic polymeric material is selected from the group consisting of polyphosphates, polysilicates, polymolybdates, and polytungstates.

3,872,025

PRODUCTION AND UTILIZATION OF SYNTHESIS GAS

Alan H. Singleton, Emmaus, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 873,777, Oct. 31, 1969, abandoned. This application May 15, 1972, Ser. No. 253,363
Int. Cl. C07c *2/02*, *2/06*
U.S. Cl. 252—373 **3 Claims**

1. An improved method of making prepressurized synthesis gas containing hydrogen from a low grade carbon monoxide containing industrial gas, after an initial removal of carbon dioxide, comprising:

a. cryogenically processing the carbon dioxide free industrial gas to form liquid carbon monoxide and cryogenically separating the carbon monoxide from the industrial gas as a liquid,

b. pumping the carbon monoxide as a liquid to raise the pressure of the liquid to from about 500 to 10,000 psia.,

c. heating the pressurized liquid carbon monoxide to above its boiling point while maintaining the pressure to produce without phase change a gaseous feed at between 500 and 10,000 psia.,

d. passing the pressurized feed gas to a high pressure catalystic water gas shift reactor and reacting said gas at substantially the pressure obtained in step (b) with steam of substantially the same pressure and at a temperature of from about 600° to about 900° F. to form prepressurized synthesis gas containing hydrogen and carbon monoxide and carbon dioxide.

3,872,026

NICKEL COMPLEX CATALYST COMPOSITIONS

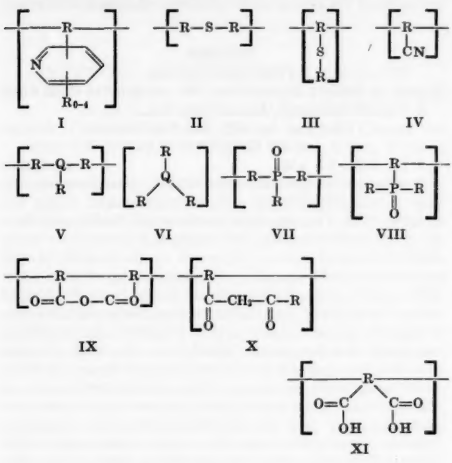
Howard E. Dunn, Mount Vernon, Ind., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 884,351, Dec. 11, 1969, Pat. No. 3,737,474. This application Mar. 30, 1973, Ser. No. 346,335
Int. Cl. B01j *11/84*
U.S. Cl. 252—429 B **11 Claims**

1. A catalyst system consisting essentially of (A) an organoaluminum compound having the formula $R''_n AlX_m$ wherein each R'' is an alkyl, alkenyl, aryl, cycloalkyl radical, or combination thereof, having from 1 to 12 carbon atoms, X is a halogen, n is 1, 2, or 3, m is 0, 1, or 2, such that n plus m equals 3, and (B) a normally solid nickel complex

wherein said (B) normally solid nickel complex is the coordination product of a nickel compound and a complexing solid polymeric component, said nickel compound is a nickel salt of an acid selected from the group consisting of mineral acids, acetic and propionic acids, the amount of organoaluminum compound present being in the range of 0.1 to 20 moles per mole of nickel complexed with the polymer,

said complexing solid polymeric component is substantially hydrocarbon insoluble and is a polymer containing repeating units represented by :



wherein each R is an aromatic or aliphatic radical having up to 12 carbon atoms, Q is nitrogen, phosphorus, arsenic, or antimony, and said complexing solid substantially hydrocarbon insoluble polymeric component contains at least 75 percent by weight of one or more of said repeating units and the balance is hydrocarbon monomer copolymerizable therewith.

3,872,027

OXIDATIVE DEHYDROGENATION CATALYSTS AND THEIR METHOD OF PREPARATION

Harold F. Christmann, Seabrook, and Paul H. Teel, Houston, both of Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 11,289, Feb. 13, 1970, abandoned. This application Aug. 6, 1973, Ser. No. 385,948

Int. Cl. B01j *11/22*

U.S. Cl. 252—430 **15 Claims**

1. In the method of preparing a catalyst for use in proceses for oxidatively dehydrogenating organic compounds wherein the method comprises

preparing a solution of a soluble iron component and another soluble metal component selected from the group consisting of Mg, Ca, Sr, Ba, Mn, Cr, Co, Ni, Zn, Cd and mixtures thereof,

contacting said solution of soluble components with a precipitation agent to precipitate an insoluble component of iron and the other metal at a temperature in the range of 20° to 100° C. and a pressure of .5 to 50 atmospheres,

recovering and filtering said insoluble metal component and calcining said metal component to form metal ferrite, wherein the improvement comprises

adding 0.1 to 4 weight percent based on the metal component of a soluble polyhydric organic compound to said solution prior to contacting said solution with said precipitating agent, said polyhydric compound having a number average molecular weight of about 3,000 to 400,000 and further being selected from the group consisting of polyesters derived from polybasic hydrocarbyl carboxylic acids and hydrocarbyl polyols; polyethers being the condensation products of ethylene oxide, propylene oxide or mixtures thereof with polyols; polysaccharides and mixtures thereof, said insoluble metal component being a gelatinous material.

3,872,028

PROCESS FOR THE PREPARATION OF PARTIALLY SULFIDED METALLIC SUPPORTED CATALYSTS

Hendrik Theodorus Rijnten, Maasland, and Eduard Theodoor Jasper Eikema, Den Brielle, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 18, 1973, Ser. No. 324,726

Claims priority, application United Kingdom, Jan. 20, 1972, 2839/72; July 28, 1972, 35356/72

Int. Cl. B01j *11/74*

U.S. Cl. 252—439 **4 Claims**

1. A process for the preparation of a partly sulfided metallic supported catalyst containing from about 2 to about 20 percent sulfur based on metal in which process a metal selected from the group consisting of nickel, molybdenum, cobalt, tungsten, iron, copper, cadmium and manganese, its hydroxide, oxide or salt, during or after precipitation on a support, is partly sulfided by contact with flowers of sulfur suspended in water at a temperature above 80°C with a pH between 7 and 11.

3,872,029

CATALYST FOR THE CONVERSION OF HYDROCARBON, A METHOD FOR THE PREPARATION OF THE CATALYST

Shinji Takase, Kawasaki, and Takahiko Yamazi, Yokohama, both of Japan, assignors to Nippon Oil company, Limited, Tokyo, Japan

Filed July 7, 1972, Ser. No. 269,712

Claims priority, application Japan, July 14, 1971, 46-51769The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl. B01j *11/40*

U.S. Cl. 252—453 **16 Claims**

1. A process for preparing a catalyst for the conversion of hydrocarbon which comprises preparing silica-alumina be reacting a water-soluble aluminum salt and a water-soluble silicon salt in an aqueous solution while maintaining the pH at least at 10, said salts being water-soluble at said pH, adding to the reaction solution an acid to adjust the pH to from about 1 to below 5 and increasing the pH of the resulting acid solution to 5–9 by addition of an alkali; blending said silica-alumina and a crystalline alumino-silicate zeolite having a silica and alumina molar ratio of at least 2.5:1 and a micropore diameter of 5–15A so that the finished catalyst ontains 5–60% by weight of said crystalline alumino-silicate; and carrying at least one hydrogenation-active metal thereon; said blending of crystalline alumino-silicate being conducted at any step before drying for dehydration of said sili a-alumina; and at least 60% of an ion-exchangeable alkali metal of said crystalline alumino-silicate being replacing with hydrogen and/or at least one polyvalent metal before and/or after said blending.

3,872,030

MIX-MULLING PROCESS FOR IMPROVED HYDROTREATING CATALYST AND RESULTING PRODUCT

Irvin Ralph Feins, Westport, and Robert Alan Bornfriend, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 6, 1973, Ser. No. 330,167

Int. Cl. B01j *11/06, 11/22*

U.S. Cl. 252—465 **10 Claims**

1. A process for preparing a hydrotreating catalyst composite which comprises: preparing an aqueous slurry of alumina powder; furnishing to said slurry sufficient of (a) a soluble cobalt compound thermally decomposable to the metal oxide to provide from about 1 to 8 percent cobalt, (b) sufficient of a soluble molybdenum compound thermally decomposable to the metal oxide to provide from about 8 to 20 percent molybdenum, and (c) sufficient urea to provide at least 0.5 mole of urea per mole of cobalt present, said furnish providing in said

slurry an aqueous solution of said furnish stable against precipitation; mix-mulling the resulting slurry so as to obtain an extrudable consistency; extruding the mixed-mulled slurry; dehydrating the extrudate; and thereafter activating the composite formed to convert said metal compounds to the corresponding oxides, said percentages being by weight, based on the weight of the activated support and expressed as the oxides.

3,872,031
PROCESS FOR ALTERING FRAGRANCE WITH 4-(2,6,6-RIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-2-BUTANONE OR 4-(6,6-DIMETHYL-2-METHYLENE-3-CYCLOHEXEN--YL)-2-BUTANONE

Braja Dulal Mookherjee, Matawan; Robert Walter Trenkle, Bricktown; Manfred Hugo Vock, West Orange, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 7, 1973, Ser. No. 386,320
Int. Cl. C11b *9/00*
U.S. Cl. 252—522 **2 Claims**

1. A process for altering the fragrance of a consumable material selected from the froup consisting of a soap, detergent cosmetic, space deodorant, space odorant, and perfume composition which comprises adding thereto a small but effective amount of a butanone compound selected from the group consisting of 4-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-2-butanone and 4-(6,6-dimethyl-2-methylene-3-cyclohexen-1-yl)-2-butanone.

3,872,032
PROCESS FOR THE PREPARATION OF GRAPHITE FLUORIDE

Toyonosuke Kanemaru, Yokohama; Toshio Shimada, Maebashi, and Isao Inudow, Shibukawa, all of Japan, assignors to Nippon Carbon Co. Ltd., Tokyo, Japan

Filed Feb. 8, 1973, Ser. No. 330,876
Claims priority, application Japan, Feb. 14, 1972, 47-15405
Int. Cl. C08b *31/00, 7/00*
U.S. Cl. 260—2 H **6 Claims**

1. A process for the preparation of a white-colored, inorganic, high molecular weight graphite fluoride having a carbon-to-fluorine atomic ratio of 1:1, comprising reacting a non-crystalline carbon selected from the group consisting of coke, carbon black, charcoal and carbonized sugar with a fluorine material consisting essentially of fluorine and hydrogen fluoride, said hydrogen fluoride being present in an amount not more than 5% by volume, of said fluorine, for a sufficient time to obtain the graphite fluoride.

3,872,033
FOAMED REACTION PRODUCT OF A RESALE WITH A SULFONATED NOVOLAC

Philip Boden, Aberdeen, Scotland; Peter John Crook, Wallasey, England; Michael Edgar Hall, Warrington, England, and Stephen Philip Riley, Prescot, England, assignors to Fibreglass Limited, Liverpool, England

Division of Ser. No. 123,851, March 12, 1971, abandoned. This application Nov. 16, 1972, Ser. No. 307,267
Claims priority, application United Kingdom, Mar. 13, 1970, 12311/70
Int. Cl. C08g *53/08;* **C08j** *1/26*
U.S. Cl. 260—2.5 F **6 Claims**

1. A solid fire-retardant phenol-formaldehyde resin foam produced by reacting a first composition with a resole in the presence of a surfactant and a foaming agent, said first composition acting as a hardener for said resole and being produced by reacting a phenol with concentrated sulphuric acid in the ratio 0.8 to 1.5 moles of sulphuric acid per mole of the phenol and then adding per mole of the phenol a quantity of formaldehyde in the range having a lower limit of 0.3 mole and an upper limit of 0.8 mole when using 0.8 mole of sulphuric acid and decreasing to 0.5 mole when using 1.5 moles of sulphuric acid; said resole being produced by reacting a phenol and formaldehyde in the ratio of at least 0.9 mole of formaldehyde per mole of the phenol in the presence of a basic catalyst.

3,872,034
PHENOLIC FOAM

Eugene A. Dickert, Kansas City, Mo., assignor to Cook Paint & Varnish Company, Kansas City, Mo.

Filed Feb. 2, 1973, Ser. No. 329,166
Int. Cl. C08g *22/16, 22/44*
U.S. Cl. 260—2.5 AM **4 Claims**

1. A rigid resole phenolic foam which is non-corrosive, free from punking, non-friable and of uniform and strong cell structure with a density of up to about 1.5 lbs/ft^3, said foam being obtained by foaming and curing at a temperature below 90°F, a reaction mixture expressed on the basis of weight percentages of the reaction mixture consisting of from about 15% to about 55% of a resole resin; from about 6% to about 20% of an alkylene glycol selected from the group consisting of ethylene glycol, butylene glycol, propylene glycol, diethylene glycol and dipropylene glycol; from about 3% to about 25% of a halo-organic phosphate plasticizer-flame retardant which has a boiling point above the reaction temperature and a halogen/carbon ratio sufficiently high to possess fire retardant properties; from about 0.01% to about 3% of stannous chloride or non-acidic organotin catalyst; from about 0.01% to about 20% of a surfactant; from about 30% to about 60% of a difunctional diisocyanate; and from about 1% to about 30% of a blowing agent which is a halogenated alkane having 1 to 3 carbon atoms and a boiling point below 90°F.

3,872,035
N-(2-HYDROXYETHYL)-ETHYLENEIMINES AS CATALYSTS FOR POLYISOCYANURATE FOAM FORMATION

Anthony J. Papa, St. Albans, W. Va., and William R. Proops, Hockessin, Del., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 764,288, Oct. 1, 1968, abandoned. This application Apr. 12, 1973, Ser. No. 350,588
Int. Cl. C08g *22/46, 22/34*
U.S. Cl. 260—2.5 AW **10 Claims**

1. A process for producing a closed cell rigid organic polyisocyanurate foam by reacting and foaming a reaction mixture comprising an organic polyisocyanate, a catalytic amount of N-(2-hydroxyethyl)-ethylene imine and a blowing agent, said blowing agent consisting of a low boiling alkane or a low boiling haloalkane.

3,872,036
PROCESS FOR PREPARATION OF RUBBER COMPOSITION

Yoshihiro Todani, Kamakura; Nagatoshi Sugi, and Kinro Hashimoto, both of Yokohama, all of Japan, assignors to The Japanese Geon Co. Ltd., Tokyo, Japan

Filed Mar. 10, 1971, Ser. No. 123,020
Claims priority, application Japan, Mar. 11, 1970, 45-20071
Int. Cl. C08c *9/04, 11/18;* **C08d** *9/00*
U.S. Cl. 260—5 **3 Claims**

1. In a process for the preparation of a carbon black-containing rubber composition wherein the rubber components of said composition consist of 80–40 percent by weight of butadiene-acrylonitrile copolymer rubber (A) and 20–60 percent by weight of isoprene-acrylonitrile copolymer rubber (B) or 60–30 percent by weight of butadiene-styrene copolyner (A) and 40–70 percent by weight of natural rubber (B), the improvement wherein a rubber composition having improved green strength is obtained by mixing 100 parts by weight of said rubber (A) with 30–100 parts by weight of carbon black, milling the resulting mixture and aging the

resulting mixture by allowing said mixture to stand at room temperature for a period of at least 12 hours, and then mixing the milled and aged mixture with said rubber (B), and milling the resultant mixture.

3,872,037

IMPROVED CARBOXYLIC LATEX FOR PAPER COATING UTILIZING BUTADIENE-STYRENE-ACRYLIC ACID-ACROLEIN TETRAPOLYMERS

Alastair Cameron MacLeod, Sarnia, Ontario, Canada, assignor to Polysar Limited-Polysar Limitee, Sarnia, Ontario, Canada

Division of Ser. No. 204,748, Dec. 3, 1971,. This application Jan. 26, 1973, Ser. No. 327,227

Claims priority, application Canada, Dec. 11, 1970, 100375

Int. Cl. C08f *15/40, 19/08, 45/06*

U.S. Cl. 260—8 **10 Claims**

1. A composition comprising (A) an alkaline latex of a copolymer of (a) at least 25 parts of an acyclic C_4-C_8 conjugated diolefin selected from butadiene-1,3, isoprene, chloroprene and 2,3-dimethyl butadiene-1,3, (b) at least 25 parts of a mono-olefinically unsaturated copolymerizable compound which is free of carbonyl and carboxyl groups selected from styrene, substituted styrenes, esters of acrylic acids and C_1-C_6 alcohols and mixtures thereof, (c) 3 parts of an olefinically unsaturated carboxylic acid selected from (a) unsaturated carboxylic acids containing 3-5 carbon atoms, (b) cinnamic acid and (c) mixtures thereof and (d) 3 parts of an olenfinically unsaturated carbonyl compound of the general formula $H(R_1)C{=}C(R_2)\text{-}C(R_3)O$ where R_1 is selected from hydrogen and C_1-C_6 monovalent hydrocarbon radicals and R_2 and R_3 are selected from hydrogen and C_1-C_2 alkyl radicals selected from acrolein, alpha-methyl, beta-methyl and beta-phenyl acroleins, methyl vinyl ketone and mixtures thereof, said parts being parts by weight per 100 parts by weight of copolymer, (B) and inert filler in amount of about 1–20 parts per one part by weight of copolymer, and (C) a starch or protein adhesive in amount of about 3–30 parts per 100 parts by weight of filler.

3,872,038

AQUEOUS BASED RELEASE COMPOSITION

William Kiger Adams, and James Alan Anderson, both of Tecumseh, Mich., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 3, 1973, Ser. No. 420,818

Int. Cl. C08g *47/02*

U.S. Cl. 260—13 **10 Claims**

1. A release composition comprising

A silicone emulsion in an amount to provide from 2 to 25 percent by weight of silicone in said release composition,

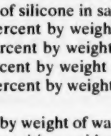
B from 0.1 to 5 percent by weight of a dispersing agent,

C from 0 to 25 percent by weight of a lubricant,

D from 20 to 60 percent by weight of a filler,

E from 0.02 to 1.5 percent by weight of a suspending agent, and

F at least 20 percent by weight of water based on the weight of the release composition, said silicone emulsion is obtained by (1) mixing an organopolysiloxane fluid having recurring units of the formula



wherein R, which may be the same or different, is selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and x is a number greater than 20, and a silicone gum having a plasticity value of from 80 to 120 millimeters with sufficient organic solvent to form a silicone solvent dispersion having an average viscosity of from 10,000 to 100,000 cps. at 25°C., said silicone gum to organopolysiloxane fluid being in a weight ratio of from 1:3 to 1:25, (2) adding said silicone dispersion to a mixture containing an emulsifying agent and sufficient water to form a water-in-oil emulsion having a paste-like consistency, said emulsifying agent and silicone dispersion being in a weight ratio of from 1:10 to 1:25 and thereafter (3) adding with agitation sufficient water to invert the water-in-oil emulsion to an oil-in-water emulsion.

3,872,039

CELLULOSIC MATERIALS INTERNALLY SIZED WITH LOW MOLECULAR WEIGHT COPOLYMERS OF ALPHA, BETA-ETHYLENICALLY UNSATURATED HYDROPHOBIC MONOMERS AND AMMONIATED CARBOXYLIC ACID COMONOMERS

Walter Lee Vaughn, Lake Jackson, and Robert James Beam, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 1, 1974, Ser. No. 438,914

Int. Cl. C08g *45/18*

U.S. Cl. 260—17.4 ST **21 Claims**

1. In a method for internal sizing of a cellulosic material wherein an internal sizing agent and a retention aid are applied to the fibers of the cellulosic material, the improvement wherein the internal sizing agent is a water-dispersible, water- and alkali-insoluble copolymer of an α,β-ethylenically unsaturated hydrophobic monomer and an ammoniated α,β-ethylenically unsaturated carboxylic acid, said copolymer having a number average molecular weight as determined by ebulliometry in the range from about 1,000 to about 10,000.

3,872,040

WAX-CONTAINING POWDER COATINGS

Kenneth L. Mollohan, Freeport, and Joseph M. Makhlouf, Mars, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 2, 1972, Ser. No. 294,046

Int. Cl. C09d *3/58, 3/60, 3/66*

U.S. Cl. 260—21 **15 Claims**

1. A method of providing a substantially void-free film surface from a resin powder coating composition which comprises the steps of:

a. incorporating from about 2 percent to about 5 percent by weight of resin solids of a natural or synthetic wax in said resin powder coating composition, wherein said resin powder coating composition comprises a resin powder selected from the group consisting of crosslinking acrylic copolymers, polyesters, polyepoxides and amide-imine polymers;

b. applying said wax-containing resin powder coating composition to a substrate; and

c. fusing said wax-containing resin powder composition thereby producing a substantially void-free film surface.

3,872,041

THERMOPLASTIC FILM

Marvin A. Koerber, Abbeville, S.C., assignor to Automation Industries, Inc., Century City, Los Angeles County, Calif.

Filed May 31, 1973, Ser. No. 365,566

Int. Cl. C08f *19/14*

U.S. Cl. 260—23 XA **8 Claims**

1. A flexible and multi-directional stretchable sheet which is resistant to flame, moisture and degradation upon exposure to ultraviolet light and temperatures between −20°F and 140°F, said sheet consisting essentially of (A) a thermoplastic resin component consisting essentially of from 45 to 80 percent, by weight, of chlorinated polyethylene and from 20 to 55 percent, by weight, of polyvinylchloride; (B) from 2 to 4 parts, by weight, based on the resin component, of a heat stabilizer selected from the group consisting of an epoxy stabilizer, a

barium-cadmium stabilizer, and an organa-tin stabilizer; (C) from 10 to 35 parts, by weight, based on the weight of the resin component, of a flame retardant selected from the group consisting of alumium oxide and antimony oxide; and (D) from 0.25 to 2.0 parts, by weight, based on the weight of the resin component, of a phosphate chelating agent.

3,872,042

PLASTIC LENSES AND METHOD OF MAKING SAME

Herbert M. Bond, Stillwater, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 222,464, Feb. 1, 1972, abandoned. This application Aug. 28, 1973, Ser. No. 392,268

Int. Cl. C08f *15/02, 15/16*

U.S. Cl. 260—23 AR **4 Claims**

1. The process of making a copolymerized lens having a convex surface and a concave surface with a monomer mixture of methyl methacrylate and diethylene glycol bis (allyl carbonate) which comprises mixing together in an evacuable container methyl methacrylate and diethylene glycol bis (allyl carbonate) with the monomer methyl methacrylate ranging from 11 to 13% by weight of the monomer mixture and the monomer diethylene glycol bis (allyl carbonate) ranging from 89 to 87% by weight of the monomer mixture, adding to the monomer mixture a catalyst of benzoyl peroxide ranging from 1 to 1.5% by weight of the monomer mixture of methyl methacrylate and diethylene glycol bis (allyl carbonate), drying the mixture to remove any water therein, evacuating the air from the evacuable container containing the mixture, followed by pressurizing the evacuable container with nitrogen gas to prevent formation of bubbles in the lens during the curing cycle, forcing the mixture into a mold followed by copolymerizing the mixture by curing the mixture in an oven at about 65° C. for a minimum of about three hours followed by raising the temperature from about 65° to about 75° C. in a minimum of about 4 hours, followed by raising the temperature from about 75° C. to about 100° C. in a minimum of about 10 hours and then stripping the copolymerized lens from the mold.

3,872,043

PREPARATION OF POLYCHLOROPRENE FOR USE IN ADHESIVES

Paul Branlard, Grenoble, and Jacques Modiano, Varces, both of France, assignors to Distugil, Clichy, France

Filed Nov. 28, 1972, Ser. No. 310,105

Claims priority, application France, Dec. 9, 1971, 71.45172

Int. Cl. C08c *11/72;* **C08d** *9/14*

U.S. Cl. 260—23.7 H **13 Claims**

1. Process for the production of polychloroprene rubber in an aqueous emulsion, comprising polymerizing chloroprene in the presence of an emulsifying system, the weight composition of which with regard to chloroprene is 1.8 to 3% of resinic acid or salt selected from the group consisting of non-modified rosin, disproportioned rosin, hydrogenated rosin and their alkaline soaps and 0.1 to 1% of saturated or unsaturated fatty acid selected from the group consisting of lauric acid, myristic acid, stearic acid, oleic acid, palmitic acid, and synthetic fatty acid, an alkaline salt of said fatty acid, a mixture of said fatty acids, mixtures of said alkaline salts, or mixtures of said fatty acids and alkaline salts.

3,872,044

THERMOPLASTIC SCREEN PROCESS INKS

John D. Hervey, Cleveland Heights, and Waymon G. Smith, Cleveland, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Filed Sept. 25, 1972, Ser. No. 291,710

Int. Cl. B44d *1/09;* **c08g** *41/02;* **C08g** *51/48*

U.S. Cl. 260—30.8 R **10 Claims**

1. A normally solid, thermo-fluid, fast-set ink free of liquid vehicle adapted for direct application by a screen process to ceramic, metal and plastic ware and for substantially instant solidification after application, said ink consisting essentially of: 60 to 80 parts by weight of a solid, thermoplastic polyamide resin consisting essentially of the reaction product of a dicarboxylic acid and a linear diamine, and 0.5 to 10.0 parts of a compatible liquid plasticizer for the resin consisting essentially of an aryl sulfonamide, said polyamide resin with said plasticizer having a melting point within the range of about 85°C to about 120°C, and a sufficient amount of a pigment to impart color to said ink.

3,872,045

FLUORINATED EPOXY RESINS CONTAINING POLYTETRAFLUOROALKYLENE FILLERS

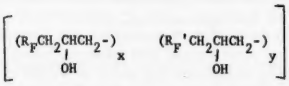
Donald E. Field, Falls Church, Va., and James R. Griffith, Riverdale Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 22, 1973, Ser. No. 390,673

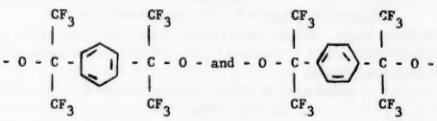
Int. Cl. C08g *30/14, 45/04, 51/02*

U.S. Cl. 260—31.2 R **12 Claims**

1. A coating comprising a solution of an epoxy - terminated polymer having recurring units of the formula



wherein the units recur more than 9 times, R_F is selected from the group consisting of



R_F' is $-OCH_2(CF_2)_zCH_2O-$, z being an integer from 2 to 12, x is integer from 1 to 4 and y is an integer from 0 to 4, and a solvent in an amount from 35 to 65 weight percent of total composition;

said solution being mixed with a fluorinated polymeric extender, a pigment and a crosslinking agent.

3,872,046

SULFONATED PHENOL (SULFO) PHTHALEIN

Saburo Torii, Tokyo; Takaaki Miyazaki, and Tatsuo Aizawa, both of Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

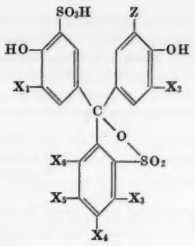
Filed Mar. 3, 1972, Ser. No. 231,744

Claims priority, application Japan, Mar. 8, 1971, 46-11812

Int. Cl. C07d *89/06*

U.S. Cl. 260—327 S **8 Claims**

1. A compound of the formula



wherein X_1 and X_2 each represent a halogen atom or alkyl group having 1 to 4 carbon atoms; X_3, X_4, X_5 and X_6 each represent hydrogen atom, halogen atom, alkoxy group having 1 to 4 carbon atoms or nitro group, and Z represents a hydrogen atom, halogen atom or sulfonic acid group, or an alkali salt thereof.

3,872,047

COMPOSITION AND METHOD FOR IMPROVING ADHERENCE OF POLYMERIC MATERIALS TO SUBSTRATES

Hana Jandourek, 4475 Jonathon Ave., Dearborn, Mich. 48126

Filed Dec. 4, 1972, Ser. No. 311,788
Int. Cl. C08f *45/32, 15/36*
U.S. Cl. 260—33.4 R **3 Claims**

1. A primer to improve the adherence of a free radical polymerized dental restorative material comprising a polar low aliphatic alcohol liquid solvent having a boiling point between about 50°C and 150°C and containing in solution a polymeric composition characterized by containing high polar, hydrophillic surface active groups and low polar hydrophobic reactive groups, said low polar reactive groups being located in terminal positions in the structure of said polymeric material, said polymeric material being the reaction product of polyacrylic acid and a monomer selected from the group consisting of glycidyl methacrylate and sulfoethylmethacrylate, the mol ratio of said polyacrylic acid to said monomer is between 0.1:1 to about 1:1 on mol weight/mol weight basis.

3,872,048

HYDRAULIC AND LUBRICATING OIL COMPOSITION

Charles L. Brown, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 28, 1970, Ser. No. 75,896
Int. Cl. C10m *1/40, 1/26*
U.S. Cl. 252—33.4 **6 Claims**

1. A hydraulic and lubricating oil composition comprising 1. 94–97 percent by weight petroleum oil which is itself a mixture of 15–95 percent by weight of solvent refined neutral oil derived from a midcontinent crude which has a viscosity of 33–41 centistokes at 100°F, a viscosity of 5.2–6.0 centistokes at 210°F and a viscosity index of 100–108, and 5 to 85 percent by weight of solvent refined neutral oil derived from midcontinent crude which has a viscosity of 110–135 centistokes at 100°F, a viscosity of 10–14 centistokes at 210°F and a viscosity index of 90 to 95;

2. about 0.3–0.5 percent by weight 2,6-ditertbutyl p-cresol;

3. an emulsifier consisting of about 2.0–3.0 percent by weight neutral calcium petroleum sulfonate as a 40–60 percent by weight mixture in a petroleum oil carrier;

4. about 0.8–1.2 percent by weight of the reaction product of ethylene oxide and nonyl phenol in a ratio between 3:1 and 7:1 and which has a hydroxyl number between 120–140; and

5. about 0.25–0.35 percent by weight sorbitan monooleate.

3,872,049

METHOD FOR PREPARING UREA URETHANE POLYMER PARTICLES

Basil S. Farah, Elma, and Henry A. Kasprzak, Lackawanna, both of N.Y., assignors to Textron, Inc., Providence, R.I.

Filed Oct. 2, 1973, Ser. No. 402,722
Int. Cl. C08g *51/28*
U.S. Cl. 260—33.6 UB **32 Claims**

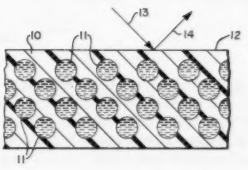
1. A method for preparing finely-divided, urea-urethane particles comprising combining under agitation and in an inert liquid, aromatic hydrocarbon-containing reaction medium, diamine and isocyanate-terminated urethane prepolymer of hydroxy-terminated polyester polyol and essentially hydrocarbon diisocyanate to provide urea-urethane polymer, said liquid reaction medium containing sufficient aromatic hydrocarbon solvent which swells urea-urethane polymer, to dissolve the isocyanate-terminated urethane prepolymer; and contacting the urea-urethane polymer with aliphatic or alicyclic hydrocarbon liquid to obtain urea-urethane particles.

3,872,050

POLYURETHANE LIQUID CRYSTAL DISPERSION SYSTEM AND DEVICES

William J. Benton, 1046 Murray Hill Ave., and Joseph R. Quigley, 6611 Ridgeville St., both of Pittsburgh, Pa. 15217

Continuation-in-part of Ser. No. 273,105, July 19, 1972, abandoned. This application Aug. 9, 1973, Ser. No. 387,110
Int. Cl. G02s *1/16*
U.S. Cl. 260—37 N **16 Claims**



1. A polymerized polyurethane elastomer which is a reaction product of at least one organic polyisocyanate and at least one organic compound containing at least one active hydrogen according to the Zerewitinoff method.

said elastomer having uniformly dispersed therethrough naked aggregates of liquid crystals which provide a visible response to application of energy said liquid crystals having a particle size of 0.1 to 300 microns and wherein the said liquid crystals constitute at least 20 per cent of the weight of the elastomer.

3,872,051

ADHESIVES CONTAINING METAL POWDERS

George T. Tiedeman, and Maurice F. Gillern, both of Seattle, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed May 25, 1972, Ser. No. 256,708
Int. Cl. C08g *51/04*
U.S. Cl. 260—38 **24 Claims**

1. In a liquid, curable adhesive composition comprising an aldehyde condensation polymer and having a pH of less than 3.5, the improvement wherein said composition further comprises a minor amount of a metal selected from aluminum and iron, said metal being in a finely divided form.

3,872,052
POLYPROPYLENE COMPOSITION

Ivor R. Fielding, Naperville, and Wassily Poppe, Lombard, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Jan. 25, 1974, Ser. No. 436,711
Int. Cl. C08f *45/16*
U.S. Cl. 260—42.46 **8 Claims**

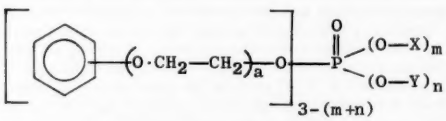
1. A composition having improved stiffness comprising a resinous polymer of propylene and an acicular hydrated sodium aluminum carbonate in a concentration of 1 to 25 parts by weight per 100 parts by weight resinous polymer of propylene, wherein said hydrated sodium aluminum carbonate has a ratio of length to diameter of at least 25:1.

3,872,053
FLAME-RETARDANT POLYURETHANE COMPOSITIONS

Joseph Fath, Princeton, and Roy T. Gottesman, Glen Rock, both of N.J., assignors to Tenneco Chemicals Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 290,059, Sept. 18, 1972, abandoned. This application Dec. 12, 1973, Ser. No. 424,237
Int. Cl. C08d *11/04*
U.S. Cl. 260—45.7 P **14 Claims**

1. A flame-retardant polyurethane resin composition that comprises (a) the reaction product of an organic polyisocyanate and a polyol having a molecular weight of at least about 500 and (b) a flame-retarding amount of a phosphate ester that has the structural formula



wherein X and Y each represents haloalkyl having 2 to 4 carbon atoms and at least 2 halogen atoms selected from the group consisting of chlorine, bromine, and mixtures thereof;
a represents a number in the range of 0 to 1; and
m and *n* each represents a number in the range of 0 to 2, the sum of *m* and *n* being 1 to 2.

3,872,054
FLAME RETARDANT ROOM TEMPERATURE VULCANIZING ORGANOPOLYSILOXANE COMPOSITION

Harvey P. Shaw, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,554
Int. Cl. C09k *3/28*
U.S. Cl. 260—45.7 R **7 Claims**

1. Composition convertible to the solid, cured elastic state upon exposure to moisture comprising
A. a substantially liquid organopolysiloxane having a viscosity of from 200 to 500,000 centistokes containing an average of from 1.85 to 2.02 silicon-bonded organic groups per silicon atom, and containing from 0.02 to 2.0 mole percent silicon-bonded hydroxyl and/or alkoxy groups;
B. an organotriacyloxysilane or an organosilicate having the formula,

$$R''Si(OY)_3$$

wherein R'' is selected from the class of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals, and cyanoalkyl radicals, and Y is selected from the class of a saturated aliphatic monoacyl radical of a carboxylic acid and an alkyl radical; and
C. an effective flame retardant amount of a halogenated organic compound containing a ratio of 4 bromine atoms to 6 chlorine atoms, and a total halogen content of about 76.9 weight percent, said flame retardant being an adduct of Cl_6C_5 containing at least one bromine substituted aromatic ring and being a white, free-flowing crystalline powder, having a melting point of 179°C, a density of 2.37 gm/cc at 20°C, a vapor pressure of 0.0014 mm Hg at 139°C, and the following solubility characteristics;

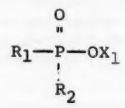
Solvent	Grams of flame retardant/100 ml of solvent at 25°C
Benzene	0.23
Xylene	0.18
Methylene Chloride	0.15
Heptane	Insoluble
Methyl Ethyl Ketone	0.07
Isopropyl Alcohol	Insoluble
Carbon Tetrachloride	0.13
Acetylene Tetrachloride	0.16

3,872,055
POLYAMIDE COMPOSITION HAVING DECREASED GEL-FORMING PROPERTY IN MOLTEN STATE

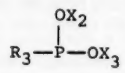
Kaoru Furukawa; Chiaki Isukamoto, and Hiroshi Nagai, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 15, 1973, Ser. No. 388,698
Claims priority, application Japan, Aug. 19, 1972, 47-83118; Sept. 7, 1972, 47-89853; Sept. 27, 1972, 47-97558
Int. Cl. C08g *51/60*
U.S. Cl. 260—45.7 P **6 Claims**

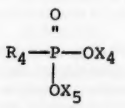
1. A polyamide composition which comprises a polyamide; at least one phosphorus component (A) selected from the group consisting of (1) a phosphinic acid compound of the formula



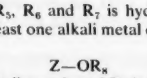
in which each of R_1 and R_2 is hydrogen, alkyl, aryl or cycloalkyl, and X_1 is hydrogen, alkyl, aryl, cycloalkyl or an alkali metal, or X_1 may be linked to either R_1 or R_2 to form a ring, (2) a phosphonous acid compound of the formula



in which R_3 is hydrogen, alkyl, aryl or cycloalkyl, and each of X_2 and X_3 is hydrogen, alkyl, aryl, cycloalkyl or an alkali metal, or one of X_2 or X_3 may be linked to R_3 to form a ring (3) a phosphinic acid compound of the formula



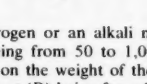
in which R_4 is hydrogen, alkyl, aryl or cycloalkyl, and each of X_4 and X_5 is hydrogen, alkyl, aryl, cycloalkyl or an alkali metal, or one of X_4 and X_5 may be lined to R_4 to form a ring, and (4) a phosphorous acid compound of the formula



in which each of R_5, R_6 and R_7 is hydrogen, alkyl, aryl or cycloalkyl; and at least one alkali metal component (B) of the formula

$$Z—OR_8$$

in which Z is an alkali metal, and R_8 is hydrogen, alkyl, aryl, cycloalkyl or a group of the formula



wherein Z' is hydrogen or an alkali metal; the amount of component (A) being from 50 to 1,000 ppm, in terms of phosphorus, based on the weight of the polyamide; and the amount of component (B) being from 1 to 5 moles, in terms of alkali metal, per mole of component (A).

3,872,056

MANUFACTURE OF PHENOL/FORMALDEHYDE RESINS

Ewald Daubach, 18 Verschaffelstrasse, 6700 Ludwigshafen; Hermann Windel, 15 Knietschstrasse, 6710 Frankenthal; Walter Boehm, 11 Mittlerer Waldweg, 6719 Kirchheim; Dieter Weiser, 14 Berliner Strasse, and Manfred Herrmann, 23 Parkstrasse, both of 6700 Ludwigshafen, all of Germany

Filed Jan. 14, 1974, Ser. No. 433,361

Int. Cl. C08g *5/06*

U.S. Cl. 260—49 **1 Claim**

1. In a process for the manufacture of sulfo group-containing phenol/formaldehyde condensates on the basis of alkaline condensation of phenols, formaldehyde or formaldehydedonating substances, a compound selected from the group consisting of sodium sulfite and sodium bisulfite and alkali metal hydroxide at elevated temperature, which phenols, formaldehyde or formaldehyde-donating substances, compound selected from the group consisting of sodium sulfite and sodium bisulfite and alkali metal hydroxides are used in the condensation in molar ratios of from 1:1.0:0.3:0.05 to 1:4:1.6:0.5, wherein the improvement comprises effecting condensation using phenol itself as starting component at temperatures of from 125° to 200°C.

3,872,057

POLYMERS COUPLED BY NITROSO GROUPS

Jose F. Pazos, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 195,027, Nov. 2, 1971, abandoned. This application Feb. 2, 1973, Ser. No. 329,072

Int. Cl. C08g *22/10*

U.S. Cl. 260—75 TN **26 Claims**

1. A nitrosated precursor compound containing an average of at least two C-nitroso groups per molecule said nitroso group being attached to an aliphatic carbon atom or to an aromatic ring containing two ortho substituents of lower alkyl, lower alkoxycarbonyl or chlorine and joined by a carbonyl linkage and at least two of which are separated from the nearest nitroso group by at least six atoms, said precursor compound being

i. organic monomers or polymers melt fabricable below 200°C; or

ii. a melt-compatible blend of said monomers or polymers, said nitrosated precursor compounds coupling to polymers at ambient temperatrue by dimerization of said nitroso groups.

3,872,058

FLUORINATED POLYURETHANE STAIN REPELLENTS

John T. Gresham, Skillman, N.J., assignor to AMC Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 184,267, Sept. 27, 1971, abandoned. This application Jan. 10, 1974, Ser. No. 432,173

Int. Cl. C08g *22/08*

U.S. Cl. 260—77.5 AM **13 Claims**

1. A fluorinated polyurethane selected from the class consisting of (A) the reaction product formed by sequentially reacting (a) an organic polyol containing 2 to 6 primary or secondary —OH functions, the polyol having a molecular weight not exceeding about 2000 and free of repeating $—OCH_2CH_2—$ units with (b) Z' moles (Z'=3–6) of an organic diisocyanate to form the adduct $J(NCO)_{z'}$ wherein J contains three to six urethane functions and then reacting $J(NCO)_{z'}$ with (c) 0.3Z' to Z' moles of $R_fC_nH_{2n-a}(OH)_aXR'(OH)_b$ wherein R_f is a perfluoroalkyl group of 4–16 carbon atoms, X=O or S, R' is a di- or trivalent saturated group which may contain in addition to carbon and hydrogen, an ether or thioether linkage, n=1-11, a=0-1, b=1-2, $a+b$=1, per mole of $J(NCO)_{z'}$ and optionally reacting any residual isocyanate functions with (d) a component selected from the class consisting of (1) an aliphatic alcohol of 1–18 carbon atoms; (2) an isocyanate blocking agent; (3) a chain extender of the group low molecular weight diamines and (4) a cross-linking agent selected from the class consisting of diols and triols and (B) the reaction product formed by reacting (a') an organic polyol selected from the group consisting of diols and triols, the polyol having a molecular weight not exceeding about 2,000 and free of repeating $—OCH_2CH_2—$ units with (b') 2–43 moles of an organic diisocyanate per mole of (a') and (c') 2–40 moles of $R_fC_nH_{2n-a}(OH)_aXR'(OH)_b$ wherein $a+b$=2 per mole of (a') and reacting the product of (a'), (b') and (c') with 0–3 moles of (d') per mole of (a') which has the values assigned to (d) aforesaid.

3,872,059

POLYMERIC SEALANTS

Christopher Scott Ely, Birmingham, England, assignor to Albright & Wilson Limited, Oldbury, Warley, West Midlands, England

Continuation of Ser. No. 259,935, June 5, 1971, abandoned. This application Oct. 29, 1973, Ser. No. 410,700

Claims priority, application United Kingdom, June 3, 1971, 18790/71

Int. Cl. C08g *23/00*

U.S. Cl. 260—79.1 **20 Claims**

1. A moisture curable sealant maintained under anhydrous conditions containing unreacted SH groups which comprises the addition product of reacting under anhydrous conditions (1) a polysulphide of the statistical formula

$$HS(CH_2(R')_bCH_2S_a)_c(CH_2(R'')_b\ CH_2S_a)_d(CH_2(R')_bCH_2)SH$$

wherein a is 2, 3 or 4; b and b' are 0 or 1; c is 20 – 50; d is less than $0.05c$; R' is a divalent radical free from aliphatic unsaturation consisting of radicals containing C, H and at least one atom selected from the group consisting of O and S in the form of

—C—O—C, —OH, or —CSC— groups;

R'' is a tri- or polyvalent radical containing C, H and at least one atom selected from the group consisting of O and S in the form of C—O—C, —OH, —SH or —CSC— groups;

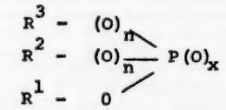
with an amount of (2) a compound of the formula $QSiX_3$ wherein Q is a group selected from a group having a terminal epoxide group, 3-(methacryloxy)-propyl group, and a $CH_2=CH(C_mH_{2m})$ group, wherein m is 0, 1, 2 or 3, at least two of X are hydrolisable groups and the remainder, if any, is selected from the group consisting of monovalent hydrocarbon and chlorohydrocarbon radicals, sufficient to react with 3–30 percent of the SH groups of said polysulphide.

3,872,060
METHOD OF SULFOALKYLATING POLYHYDRIC ALCOHOLS AND THE CORRESPONDING PRODUCT

Noel I. Burke, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Oct. 4, 1973, Ser. No. 403,346
Int. Cl. C08b 3/00, 9/00; C08f 27/06
U.S. Cl. 260—79.3 R 20 Claims

1. A process for sulfoalkylating a polyhydric alcohol which comprises reacting said polyhydric alcohol with a sulfur trioxide-organophosphorus complex represented by the formula:



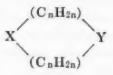
where R^1, R^2, and R^3 are hydrogen or alkyl cycloaliphatic groups containing up to 18 carbon atoms provided that at least one of the groups R^1, R^2, and R^3 is organic, (O) represents oxygen, n is 0 or 1, x is 0 or 1, and P represents phosphorus, said sulfur trioxide being present from 0.1–0.8 moles per mole of organophosphorus compound and said complex being present in a proportion sufficient to provide at least 50 mole percent SO_3 in excess of the stoichiometric requirement to form the sulfoalkylated ester, under conditions for forming the sulfoalkylated ester of said polyhydric alcohol.

3,872,061
DIAZACYCLODIONES

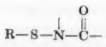
Kamel Boustany, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 56,682, July 20, 1970, abandoned. This application May 3, 1973, Ser. No. 356,778
Int. Cl. C08d 9/00; C08c 11/54
U.S. Cl. 260—79.5 B 12 Claims

1. A method of inhibiting premature vulcanization of vulcanizable rubber containing sulfur or sulfur-containing vulcanizing agent and an accelerating agent selected from the group consisting of thiazole accelerators, dithiocarbamate accelerators, thiuram sulfide accelerators, aldehyde-amine accelerators and guanidine accelerators which comprises: incorporating therein, in an amount effective to inhibit premature vulcanization, a six membered ring compound of the formula



in which X and Y are



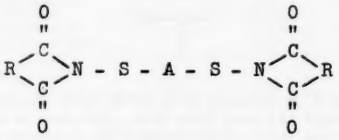
and are linked to each ring carbon atom through the same or different elements, n is 1–6, and R is alkyl of 1–20 carbon atoms, aralkyl of 7–10 carbon atoms, cycloalkyl of 5–12 carbon atoms, alkaryl of 7–10 carbon atoms, phenyl or naphthyl.

3,872,062
IMIDE ADDITIVES FOR SULFUR VULCANIZABLE POLYMERS

John P. Lawrence, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

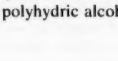
Division of Ser. No. 266,008, June 26, 1972. This application Mar. 7, 1974, Ser. No. 448,857
Int. Cl. C08c 11/60; C08d 9/00; C08f 27/06
U.S. Cl. 260—79.5 B 8 Claims

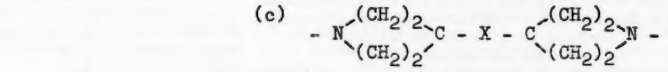
1. A sulfur vulcanizable diene polymer having incorporated therein at least one imide having the following structural formula



wherein A is an N,N′-disubstituted radical selected from the group consisting of

a. an N,N′-disubstituted radical which is a derivative of a heterocyclic diamine,

(b)  and

(c) 

wherein R is selected from the group consisting of saturated or olefinic divalent aliphatic radicals having 1 to 7 carbon atoms, saturated or olefinic divalent cyclic aliphatic radicals having 5 to 10 carbon atoms and arylene radicals having 6 to 10 carbon atoms and wherein R^1 is selected from the group consisting of alkyl radicals having 1 to 20 carbon atoms, cyanoalkyl radicals having 2 to 21 carbon atoms, cycloalkyl radicals having 5 to 20 carbon atoms, aralkyl radicals having 7 to 20 carbon atoms and aryl radicals having 6 to 20 carbon atoms, and wherein X is selected from the group consisting of alkylene radicals having 2 to 10 carbon atoms, cycloalkylene radicals having 5 to 10 carbon atoms and arylene radicals having 6 to 10 carbon atoms.

3,872,063
POLYMERIZATION PROCESS

Oh-Kil Kim, Springfield, Va., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 29, 1972, Ser. No. 284,690
Int. Cl. C08f 1/70, 1/74
U.S. Cl. 260—80 C 9 Claims

1. A process for effecting the aqueous polymerization of a polymerizable vinyl, acrylic or methacrylic monomer which consists in: polymerizing at temperatures ranging from 0°C. to 100°C. an aqueous solution of an α,β-ethylenically unsaturated water soluble vinyl, acrylic or methacrylic monomer in the presence of a polymerization catalyst system consisting of a cyclic or an acyclic polyhydric alcohol and an alkali metal sulfite or an alkali bisulfite and in the absence of an oxygen or peroxide environment, and recovering resultant storage-stable, high molecular weight polymer.

3,872,064

LIQUID HYDROCARBON DERIVED RESIN

Henry A. Pace, Akron; David R. St. Cyr, Uniontown, and Herbert L. Bullard, Norton Village, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 192,581, Oct. 26, 1971, abandoned. This application Jan. 14, 1974, Ser. No. 433,031

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.7 3 Claims

1. A hydrocarbon-derived resin having a structure characterized by a softening point in the range of about 15°C to about 25°C, a viscosity at about 25°C in the range of about 1,000 to about 20,000 centipoises and comprising from about 50 to about 75 weight percent units derived from piperylene and correspondingly from about 50 to about 25 weight percent units derived from 2-methyl-2-butene, prepared by the method which comprises polymerizing a mixture comprising from about 35 to about 65 weight percent piperylene and correspondingly from about 65 to about 35 weight percent 2-methyl-2-butene, and containing up to about 20 weight percent of at least one other unsaturated hydrocarbon selected from at least one of the group consisting of piperylene dimers, piperylene trimers and other unsaturated hydrocarbons containing from 4 to 6 carbon atoms based on 100 weight percent of said piperylene/2-methyl-2-butene mixture, at a temperature in the range of about 10°C to about 500°C in the presence of a catalyst selected from the group consisting of boron trifluoride and boron trifluoride etherate, wherein the etherate is derived from boron trifluoride and an ether selected from dimethyl ether, diethyl ether, methyl ethyl ether, di-n-propyl ether, diisopropyl ether, di-n-butyl ether, diisobutyl ether, di-t-butyl ether, di-n-amyl ether, diisoamyl ether, di-t-amyl ether, ethyl amyl ether, diisohexyl ether, di-n-hexyl ether, di-t-hexyl ether and butyl (2-ethyl hexyl) ether.

3,872,065

VULCANIZABLE FLUOROELASTOMER COMPOSITION

Walter Werner Schmiegel, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 3, 1973, Ser. No. 403,325

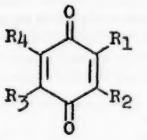
Int. Cl. C08f *27/00, 37/00*

U.S. Cl. 260—80.76 8 Claims

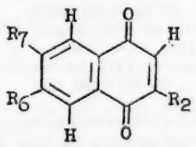
1. A vulcanizable fluoroelastomer composition which comprises

A. an elastomeric copolymer of vinylidene fluoride and at least one other fluorine-containing monomer,

B. as a vulcanization agent for said copolymer, a quinone compound selected from the group: 1,4-benzoquinones of the formula



wherein R_1, R_2, R_3 and R_4 are selected individually from the group: H, alkyl, aryl, alkaryl and aralkyl, at least two of said R's being H, and 1,4-naphthoquinones of the formula



wherein R_5, R_6 and R_7 are selected individually from the group: H, alkyl and aralkyl,

C. as a vulcanization accelerator capable of accelerating the cure of component (A) in the presence of component (B), a quaternary ammonium, phosphonium, stibonium or arsonium compound, and

D. a divalent metal oxide or hydroxide; said composition containing for each 100 parts by weight of component (A), about 0.2–7 parts by weight of compound (B), about 0.1–10 parts by weight of component (C), and about 1–20 parts by weight of component (D).

3,872,066

PERFLUOROMETHYLENECYCLOPROPANE AND POLYMERS THEREOF

Bruce E. Smart, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 339,422, March 8, 1973, Pat. No. 3,816,553. This application Jan. 18, 1974, Ser. No. 434,416

Int. Cl. C08f *5/00, 15/02, 15/06*

U.S. Cl. 260—80.76 13 Claims

1. A polymer containing from 0.1 to 100% by weight of units derived from perfluoromethylenecyclopropane by ring-opening polymerization and from 0 to 99.9% complementally of units derived from at least one comonomer consisting of a compound polymerizable by freeradical initiated chain propagation.

3,872,067

PROCESS FOR PREPARING CHLOROMETHYLATED POLYSTYRENE-DIVINYLBENZENE COPOLYMER

Nicholas D. Harris, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Sept. 17, 1973, Ser. No. 398,177

Int. Cl. C08f *7/06*

U.S. Cl. 260—80.78 1 Claim

1. The process for preparing chloromethylated polystyrenedivinylbenzene copolymer which consists in polymerizing styrene, vinylbenzyl chloride and divinylbenzene in the presence of benzoyl peroxide.

3,872,068

PROCESS FOR PREPARING BLOCK COPOLYMER RESIN

Shigeki Horiie, Yokohama; Susumu Kurematsu, Zama, and Shin-ichiro Asai, Tokyo, all of Japan, assignors to Denki Kagaku Kogyo K.K., Machida, Japan

Continuation of Ser. No. 134,391, April 15, 1971, abandoned. This application May 4, 1973, Ser. No. 357,170

Claims priority, application Japan, Apr. 24, 1970, 45-034737

Int. Cl. C08f *19/08, 1/28*

U.S. Cl. 260—83.7 7 Claims

1. A process for preparing an impact resistant block copolymer which comprises:

forming a complex of lithium metal and biphenyl or terphenyl in a solvent selected from the group consisting of tetrahydrofuran, tetrahydropyran, ethylene glycol diethyl ether, ethylene glycol dimethyl ether and diethylene glycol dimethyl ether at a temperature of −78°C to 30°C wherein 1 – 10 gram atom of lithium per mole of said biphenyl or terphenyl is used,

reacting butadiene with said complex so as to prepare a aromatic hydrocarbon soluble butadiene oligomer dilithium,

removing said solvent from said complex and contacting and polymerizing a vinyl substituted aromatic hydrocarbon and a conjugated diene in the presence of said complex, wherein said polymerization reaction is effected in an aromatic hydrocarbon solvent so as to form a block copolymer having a middle portion of an elastomeric tapered copolymer of a conjugated diene and a minor amount of a vinyl substituted aromatic hydrocarbon, which is chain terminated on both ends with blocks of a polymerized vinyl substituted aromatic hydrocarbon.

3,872,069

PROCESS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF ISOBUTYLENE

Aldo Priola; Sebastiano Cesca, and Giuseppe Ferraris, all of San Donato Milanese, Italy, assignors to Snamprogetti, S.p.A., San Donato Milanese, Italy

Filed Mar. 9, 1973, Ser. No. 339,940
Claims priority, application Italy, Mar. 11, 1972, 21727/72
Int. Cl. C08d *1/26, 3/10*
U.S. Cl. 260—85.3 R 6 Claims

1. Process for the production of butyl rubber through the copolymerization of isobutylene and isoprene wherein the improvement comprises conducting the copolymerization reaction in the presence of a catalyst system consisting essentially of:

a. a metalorganic compound having the following general formula

$$R_m \text{ Me } X_n$$

wherein

R is a monovalent alkyl, aryl, cycloalkyl, aralkyl or alkylaryl radical having from 1 to 12 carbon atoms;

Me is a metal selected from Al, Ti, Sn, V, Zn, B, Pb, W, Zr, As, Bi and Mo;

X is halogen, hydrogen, alkoxy or an ester group;

m may be 0 or an integer ranging from 1 to 4;

n is a number ranging from 1 to 5;

m + *n* being the valence of the metal Me; and

b. an organic compound having an electron affinity value ranging from 0.3 to 2 electron volts, selected from the group consisting of: 1,3,5-trinitrobenzene; 2,4,6-trinitrotoluene; pyromellitic anhydride; 2,4,7-trinitro-9-fluorenone; tetrachloro-p-benzoquinone and tetrabromo-p-benzoquinone.

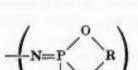
3,872,070

DIBROMOBUTYL PHOSPHORONITRIDE ESTERS

Gerd Wunsch, Speyer; Volker Kiener, Ludwigshafen; Friedrich Fuchs, Kirchheim; Walter Himmele, Walldorf, and Werner Fliege, Otterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen/Rhine, Germany

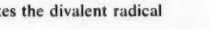
Filed Oct. 24, 1973, Ser. No. 409,256
Claims priority, application Germany, Oct. 26, 1972, 2252485
Int. Cl. C07d *105/04;* C09k *3/28*
U.S. Cl. 260—927 N 2 Claims

1. A compound of the formula



(I)

where R denotes the divalent radical



and *n* is an integer of from 3 to 8 inclusive, and mixtures thereof.

3,872,071

POLYMERS OF CONJUGATED DIENE HYDROCARBONS AND METHOD OF PREPARATION

James Neil Henderson, Hudson, and Frank G. Shaheen, Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 278,307, Aug. 7, 1972, abandoned, which is a continuation of Ser. No. 113,726, Feb. 8, 1971, Pat. No. 3,682,084, Continuation of Ser. No. 776,770, Nov. 18, 1968, abandoned. This application Apr. 5, 1974, Ser. No. 458,372
Int. Cl. C08d *1/14, 5/02, 5/04*
U.S. Cl. 260—94.3 1 Claim

1. A method of preparing a polymer of a conjugated diene hydrocarbon which comprises

A. polymerizing at least one conjugated diene hydrocarbon selected from 1,3-butadiene, 2-methyl-1,3-butadiene, 2-ethyl-1,3-butadiene and 1,3-pentadiene at a temperature in the range of about 0°C to about 100°C to form a polymer having an inherent viscosity in the range of about 5 to about 12 as determined in benzene at 30°C and about 90 to about 100 percent of a trans-1,4 structure in a dilute solution of an inert solvent, containing less than about 5 weight percent monomer, and a catalyst prepared by mixing a vanadium compound selected from vanadium trichloride and the product of vanadium tetrachloride and titanium tetrachloride with at least one organoaluminum compound selected from the group consisting of triethyl aluminum, tripropyl aluminum, triisopropyl aluminum, tributyl aluminum and triisobutyl aluminum and with up to about 3 moles of a titanium compound per mole of the vanadium compound where the titanium compound is selected from the group consisting of titanium triacetylacetonate and titanium compounds selected from the group consisting of titanium triacetylacetonate, titanium tetrapropoxide, titanium tetraisopropoxide, titanium tetra normal butoxide and titanium tetraisobutoxide, wherein the mole ratio of the organo aluminum compound to the vanadium compound is from about 1.5:1 to about 30:1, and the mole ratio of the titanium compound to the vanadium compound is from about 1.5:1 to about 30:1, and

B. mixing essentially and sufficient gaseous oxygen by agitation with the mixture of polymerized diene hydrocarbon, solvent and active catalyst at a temperature of about 20°C to about 50°C and a mole ratio of oxygen to the aluminum compounds of about 0.25 to about 2.5 to enable a rapid reduction of the polymer's inherent viscosity by at least about 50 percent, wherein said method is characterized by the polymer's inherent viscosity being reduced by at least about 50 percent within about 1 minute at about 25°C with vigorous mixing with oxygen when the polymer concentration is less than about 5 weight percent.

3,872,072

NEW HYDROGENATION CATALYST FOR ELASTOMERS, AND THE PROCESS OF HYDROGENATION

Adel Farhan Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Dec. 13, 1973, Ser. No. 424,264
Int. Cl. C08d *5/00*
U.S. Cl. 260—94.7 H 3 Claims

1. The process of hydrogenating an unsaturated elastomer which comprises hydrogenating the same in solution in an aliphatic solvent in the presence of 0.02 mM to 1.0 mM per gram of elastomer of a catalyst which is reduced cobaltous chloride.(lactam)$_n$ or $_n$ catalyst, which lactam having the formula

in which n=0 to 20 and which reducing agent is a trialkyl or triaryl aluminum or a dialkyl or diaryl aluminum hydride at a temperature of 250° to 500° C. and a pressure of 25 to 1000 psig.

3,872,073
PROCESS FOR THE PREPARATION OF CRYSTALLIZATION-RESISTANT DISPROPORTIONATED ROSIN

Susan Dale Thorpe; Curry Beach Davis, and Charles Glenn Wheelus, all of Panama City, Fla., assignors to Arizona Chemical Company, New York, N.Y.

Filed May 21, 1973, Ser. No. 362,618
Int. Cl. C09f *1/00, 5/00*
U.S. Cl. 260—106 **7 Claims**

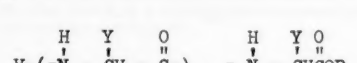
1. A method for preparing a crystallization-resistant disproportionated rosin comprising the steps of: heating a rosin until the 9,10-secodehydroabietic acid is increased to from 5 to 10 percent, based on the weight of said rosin, at a temperature ranging from about 250°C. to about 275°C. in the presence of about 0.3 to about 1 percent of a phenol sulfide selected from a group consisting of 1,1′-di-(2-naphthol)-disulfide, 1,1′-di-(2-naphthol)-sulfide, and 1-thio-2-naphthol, and recovering said crystallization-resistant disproportionated rosin.

3,872,074
METHOD FOR THE AMINOLYSIS OF ACTIVATED ESTERS IN THE PRESENCE OF N-HYDROXY COMPOUNDS AS CATALYSTS

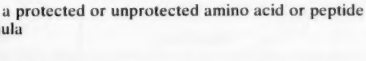
Wolfgang Koenig, Langenhaim/Taunus; Rolf Geiger, Frankfurt/Main, and Hans Wissmann, Bad Soden/Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Filed June 20, 1972, Ser. No. 264,441
Claims priority, application Germany, Jan. 20, 1972, 2202613
Int. Cl. C07c *103/52;* **C07g** *7/00*
U.S. Cl. 260—112.5 **2 Claims**

1. In a method for synthesizing a peptide which comprises reacting a protected amino acid or protected peptide of the formula

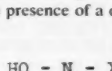


with a protected or unprotected amino acid or peptide of the formula



wherein V is an amino protective group or pyroglutamyl: Y is a protected or unprotected side chain of a natural or synthetic α-or β-amino acid, or

may be pyrrolidinyl; R is di-, tri-, tetra-, or pentachlorophenyl, nitrophenyl, or chloronitrophenyl; m_1 is zero or an integer from 1 to about 10; m_2 is zero or an integer from 1 to an order of magnitude of 500; and W is hydroxy, O-alkyl, O-aralkyl, amino-alkylamino, aralkylamino, or arylamino, or a polymeric carrier bonded by an ester or amide bond, the improvement wherein the reagents are reacted in a strongly polar solvent in the presence of a catalytic compound of the formula



wherein X is C=O, C=S, or N= and X and N are members of a 5-or 6-membered substituted or unsubstituted heterocyclic ring, or of such a ring containing 1 or 2 additional hetero atoms, or of such rings fused with a substituted or unsubstituted benzene nucleus, said catalytic compound having a pK-value for the −N=OH group thereof which is between 3.7 and 4.2, and wherein the substituents on said substituted heterocyclic ring and on said substituted benzene nucleus are selected from the group consisting of lower alkyl, lower alkoxy, halo, perhalo lower alkyl and nitro.

3,872,075
SALTS OF AMINO-ACIDS WITH POLYSULFURIC ESTERS OF NATURAL GLY-COPEPTIDES AND PROCESS FOR PREPARING SAME

Adriano Butti, Como, and Giuseppe Prino, Milan, both of Italy, assignors to Crinos Industria Farmacobiologica S.p.A., Villa Guardia, Italy

Filed Oct. 10, 1973, Ser. No. 405,179
Claims priority, application Italy, Oct. 18, 1972, 30582/72
Int. Cl. C07g *7/00*
U.S. Cl. 260—112 R **15 Claims**

1. In the process for preparing sulfoglycopeptide salts comprising:

a. hydrolyzing the gastric mucosa or duodenum of swine in water at a temperature from about 50°C. to about 100°C. for from about 10 minutes to about 45 minutes at a pH from about 1 to 10;
b. removing acidic hydrolysis by-products obtained by the hydrolysis of (a);
c. diluting the product of (b) with a non-solvent therefore whereby a glycopeptide is precipitated therefrom;
d. suspending the product of (c) in a heterocyclic tertiary base having a boiling point of from about 100°C. to about 200°C.;
e. contacting the resulting suspension of (d) with a sulfonating agent selected from the group consisting of sulfuric acid, oleum, chlorosulfonic acid and an adduct of sulfuric anhydride with an organic compound, at a temperature from about −40°C. to about 0°C. and then a temperature from about 50°C. to about 80°C., and recovering the resulting sulfonated product;
f. reacting the product recovered in (e) with a hydroxide selected from the group consisting of an alkali metal hydroxide, an alkaline earth metal hydroxide and ammonium hydroxide, whereby the sulfonated product is converted to its corresponding alkali, alkaline earth metal or ammonium salt; and
g. contacting the product resulting from (f) with acetone or methyl alcohol whereby said salt is precipitated,

the improvement wherein an amino acid salt of sulfoglycopeptide is prepared, comprising:

1. contacting an aqueous solution of the salt which is the product of (g) with a strongly cationic ion exchange resin

whereby said sulfoglycopeptide salt is converted into a free acid; and

2. contacting said free acid resulting from (1) with an alpha-amino acid selected from the group consisting of glutamine, methionine, histidine, lysine, asparaginine, arginine, cysteine, proline, serine, threonine, and tryptophane.

3,872,076

16-DIAZOKETONES OF THE ANDROSTANE, PREGNANE, ESTRANE, AND 19-NORPREGNANE SERIES

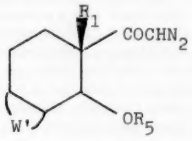
Perry Rosen, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 14, 1972, Ser. No. 217,956

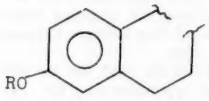
Int. Cl. C07c *113/02;* **A61k** *17/06*

U.S. Cl. 260—141 **9 Claims**

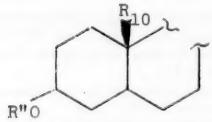
1. A compound of the formula



wherein R_1 is lower alkyl of from 1 to 5 carbon atoms, R_5 is hydrogen or lower alkanoyl and W' is



or



wherein R is hydrogen, lower alkyl or lower alkanoyl R'' is hydrogen or lower alkanoyl and R_{10} is hydrogen or methyl.

3,872,077

AZO PIGMENTS FROM A 1-AMINOANTHRAQUINONE DIAZO COMPONENT AND A PHTHALIMIDACETOACETANILIDE COUPLING COMPONENT

Peter Dimroth; Joerg Redeker, and Wolfgang Lotsch, all of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhein, Germany

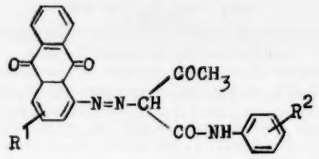
Filed Apr. 23, 1973, Ser. No. 353,619

Claims priority, application Germany, May 17, 1972, 2224010

Int. Cl. C09b *29/32*

U.S. Cl. 260—152 **2 Claims**

1. An azo pigment of the formula:



in which

R^1 is hydrogen or chloro in the meta-position or para-position to the diazo group; and

R^2 is phthalimido in the meta-position or para-position.

3,872,078

DISAZO PIGMENTS, PROCESSES FOR THEIR MANUFACTURE AND USE

Georg Cseh, Basel, and Willy Muller, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

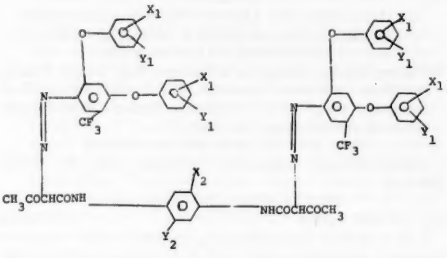
Filed Nov. 7, 1972, Ser. No. 304,426

Claims priority, application Switzerland, Nov. 11, 1971, 16374/71

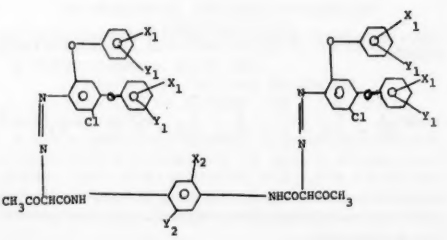
Int. Cl. C09b *33/16*

U.S. Cl. 260—176 **7 Claims**

1. A disazo pigment of the formula



or



wherein X_1, Y_1 and X_2 is hydrogen, chloro, bromo, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 5 carbon atoms, or carbalkoxy of 1 to 5 carbon atoms, and Y_2 is hydrogen, chloro, bromo, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms.

3,872,079

SEMISYNTHETIC DERIVATIVES OF TOBRAMYCIN

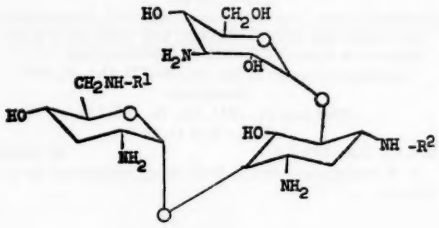
Takayuki Naito, and Susumu Nakagawa, both of Tokyo, Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 232,978, March 8, 1972, abandoned. This application Mar. 13, 1973, Ser. No. 340,852

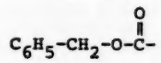
Int. Cl. C07c *129/18*

U.S. Cl. 260—210 AB **7 Claims**

1. A compound having the formula



in which R^1 is H or



and R^2 is H, L-(−)-γ-amino-α-hydroxybutyryl, L-(−)-β-amino-α-hydroxypropionyl, L-(−)-δ-amino-α-hydroxyvaleryl, L-(−)-γ-benzyloxycarbonylamino-α-hydroxybutyryl, L-(−)-β-benzyloxycarbonylamino-α-hydroxypropionyl, or L-(−)-δ-benzyloxycarbonylamino-α-hydroxyvaleryl, wherein R^1 or R^2 must be other than H; or a nontoxic pharmaceutically acceptable acid addition salt thereof.

3,872,080

PROCESS FOR THE PREPARATION OF GARAMINE AND INTERMEDIATES PRODUCED THEREBY

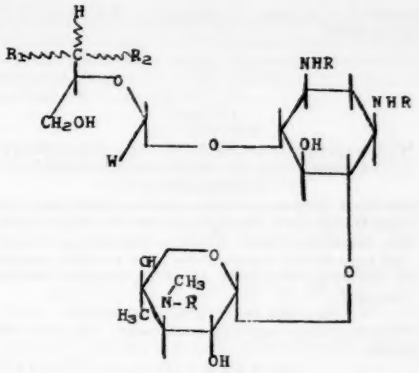
Peter J. L. Daniels, Cedar Grove, N.J., assignor to Schering Corporation, Bloomfield, N.J.

No Drawing. Filed June 26, 1973, Ser. No. 373,692

Int. Cl. C07c *129/08*

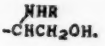
U.S. Cl. 260—210 R **23 Claims**

15. A compound represented by the following formula IV:



IV

wherein R is a member selected from the group consisting of hydrogen and an amino-protecting group selected from the group consisting of benzyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl, methoxycarbonyl, ethoxycarbonyl, acetyl and benzoyl; R_1 is a member selected from the group consisting of hydrogen and methyl; R_2 is a member selected from the group consisting of hydroxy and —NHR; and W is a member selected from the group consisting of —CH_2OH and



3,872,081

DIGITOXIGENIN RHAMNOSIDE CYCLOCARBONATES

Ulrich Stache; Werner Haede, both of Hofheim, Taunus; Werner Fritsch, Neuenhain, Taunus; Kurt Radscheit, Kelkheim, Taunus, and Ernst Lindner, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

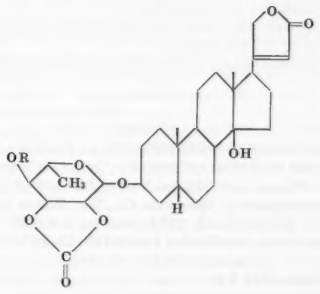
Filed June 18, 1973, Ser. No. 370,685

Claims priority, application Germany, June 20, 1972, 2230004

Int. Cl. C07c *173/02*

U.S. Cl. 260—210.5 **5 Claims**

1. A digitoxigenine-3-α-[L-rhamnopyranoside-2',3'-cyclocarbonate] of the formula I



(I)

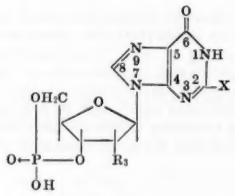
wherein R is hydrogen or alkanoyl or alkyl having 1 to 5 carbon atoms.

3,872,082
SUBSTITUTED PURINERIBOFURANOSIDE-3,5-CYCLOPHOSPHATE COMPOUNDS AND PROCESS FOR THEIR PREPARATION

Hans Ulrich Bergmeyer; Michael Nelboeck-Hochstetter; Gerhard Michal, all of Tutzing/Upper Bavaria; Klaus Muhlegger, Starnberg; Gunter Weimann, Percha/Upper Bavaria, and Egon Roesch, Lampertheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldorf, Germany

Filed May 11, 1972, Ser. No. 252,393
Claims priority, application Germany, May 19, 1971, 2125077
Int. Cl. C07d *51/52, 51/54*
U.S. Cl. 260—211.5 R **24 Claims**

1. Purine-ribofuranoside-3′,5′-cyclophosphate compound of the formula



(I)

wherein X is:

i.

in which R_1 and R_2, which can be the same or different, are alkyl or cycloalkyl of up to 6 carbon atoms, aryl and aralkyl of up to 4 carbon atoms in the alkyl group and from 6 to 10 carbon atoms in the aryl moiety; or wherein R_1 and R_2, together with the nitrogen atom to which they are attached, form a 6-membered heterocyclic ring; or R_2 can be hydrogen;

ii. chlorine or fluorine;

iii. sulfhydryl or alkylthio of from 1 to 6 carbon atoms;

iv. alkyl of up to 6 carbon atoms;

v. alkylsulfonyl or alkylsulfoxy; or

vi. hydrocarbylthio where the hydrocarbyl moiety contains up to 12 carbon atoms

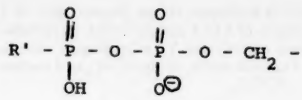
and the physiologically compatible salts of said compound.

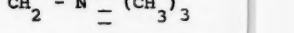
3,872,083
NUCLEOSIDE-5′-DIPHOSPHATE ETHANOLAMINES AND METHOD OF PRODUCING THE SAME

Masaru Okutsu, and Akihiro Yamazaki, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,574
Claims priority, application Japan, Feb. 23, 1972, 47-18669
Int. Cl. C07d *51/52, 51/54*
U.S. Cl. 260—211.5 R **14 Claims**

7. A compound of the formula





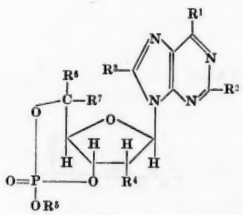
wherein R′ is the 5′-riboside radical or inosine, 5-amino-1-ribofuranosylimidazole-4-carboxamide, N^1-methylinosine, 2-methylinosine, 6-thioinosine, 2-methylthioinosine, or N^2-methylguanosine.

3,872,084
PURINE NUCLEOSIDE 3,5-CYCLICPHOSPHATE COMPOUNDS

Gordon H. Jones, Cupertino; Ramachandran S. Ranganathan, San Diego, and John G. Moffatt, Los Altos, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 294,777, Oct. 10, 1972, abandoned
Filed July 11, 1973, Ser. No. 378,219
Int. Cl. C07d *51/54*
U.S. Cl. 260—211.5 R **20 Claims**

1. A compound selected from those represented by the formula:



(A)

wherein

R^1 is chloro, amino, acylamino, alkylamino, aralkylamino, dialkylamino, diaralkylamino, sulfhydral, alkylthio, arylthio, aralkylthio, hydroxy, alkoxy, aryloxy, or aralkoxy in which the acyl radical contains 1 to 22 carbon atoms, each alkyl radical contains 1 to 18 carbon atoms, and each aralkyl radical contains 7 to 20 carbon atoms;

R^2 is hydrogen or amino;

R^3 is hydrogen, halo, hydroxy, alkoxy, aryloxy, aralkoxy, sulfhydryl, alkylthio, arylthio, aralkylthio, azido, amino, acylamino, alkylamino, aralkylamino, dialkylamino, or diaralkylamino in which the acyl radical contains 1 to 22 carbon atoms, each alkyl radical contains 1 to 18 carbon atoms, and each aralkyl radical contains 7 to 20 carbon atoms;

R^4 is hydroxy, an acyloxy radical having from 1 to 22 carbon atoms, tetrahydropyran-2-yloxy, tetrahydrofuran-2-yloxy or 4-(lower)-alkoxytetrahydropyran-4-yloxy;

R^5 is hydrogen or a pharmaceutically acceptable cation; and

One of R^6 and R^7 is hydrogen and the other of R^6 and R^7 is a lower alkyl group or R^6 and R^7 are identical lower alkyl groups.

3,872,085
PREPARATION OF SALTS OF ALPHA-D GLUCOSE-PHOSPHORIC ACID

Lucien Penasse, Paris, and Pierre Barthelemy, Clichy-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

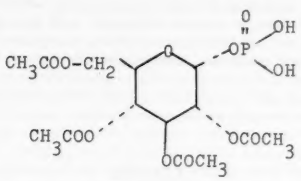
Filed Jan. 11, 1973, Ser. No. 322,847

Claims priority, application France, Jan. 19, 1972, 72.01719

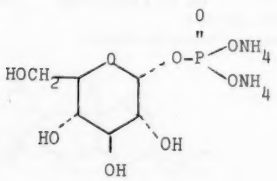
Int. Cl. C07c *69/32*; **C07d** *51/50*

U.S. Cl. 260—234 R **4 Claims**

1. A process for the preparation of ammonium α-D-glucose-1-phosphate consisting essentially of reacting a compound of the formula



in methanol with ammonia to obtain the ammonium salt of α-D-glucose-1-phosphate of the formula



3,872,086
CERTAIN DISULFIDE DERIVATIVES OF 2-AZETIDINONES

Derek Harold Richard Barton, London; William George Elphinstone Underwood, Stoke Poges; Brian Edgar Looker, Greenford; Graham Hewitt, Northolt, and Michael Victor Taylor, London, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

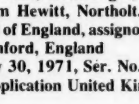
Filed July 30, 1971, Ser. No. 167,848

Claims priority, application United Kingdom, Nov. 3, 1970, 52288/70

Int. Cl. C07d *25/00*, *49/10*

U.S. Cl. 260—239 A **2 Claims**

1. A compound of the formula



wherein R^1 is the group —NHCOR, where R is hydrogen or RCO—is selected from the group consisting of:

$$R^u(O)_rC_nH_{2n}—CO$$

where R^u is cycloalkyl, cyclohexadienyl, phenyl, fluorophenyl, nitrophenyl, aminophenyl, acetoxphenyl, methoxphenyl, methylphenyl, hydroxyphenyl, N,N-bis(2-chloroethyl)-aminophenyl, R^2 is hydrogen, an alkyl or alkenyl group having up to 4 carbons and which can carry one or more halogen atoms, esterified carboxyl groups wherein the esterifying group is methyl, 2,2,2-trichlorethyl or p-nitro benzyl, or R^2 is a 1-pyrazolin-3-yl group; and R^3 is an alkyl group containing one to six carbon atoms, benzyl, phenethyl, phenylpropyl or a cycloalkyl group containing five to seven carbon atoms, *r* is 0 or 1 and *n* is an interger from 1–4.

3,872,087
PROCESS FOR PRODUCTION OF 1,3-DISUBSTITUTED AZETIDINE DERIVATIVES

Kunio Tsukamoto, Tokyo; Yasushi Suzuki, Yokohama; Akihiro Izumi, Kawasaki, and Yoshio Hiramatsu, Tokyo, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

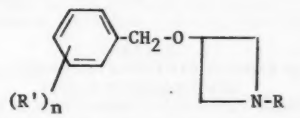
Continuation-in-part of Ser. No. 92,252, Nov. 23, 1970. This application Oct. 17, 1972, Ser. No. 298,371

Claims priority, application Japan, Nov. 28, 1969, 44-95027; Mar. 31, 1970, 45-26548; Mar. 31, 1970, 45-26549; July 21, 1970, 45-63377; Oct. 16, 1970, 45-90429; Nov. 13, 1970, 45-99733

Int. Cl. C07d *25/00*

U.S. Cl. 260—239 A **19 Claims**

1. A compound of the formula



wherein R is an alkyl group of one to 13 carbon atoms or an aralkyl group of seven to nine carbon atoms,

R′ is a hydrogen atom or an electron donor group selected from the group consisting of an alkyl group of one to four carbon atoms, an alkoxy group of one to four carbon atoms, a halogen atom and a halogenated alkyl group of one to four carbon atoms, and n is an integer of 1 to 3.

3,872,088
METHOD FOR THE PRODUCTION OF D(-)-α-AMINOBENZYLPENICILLIN DIRECTLY FROM NATURAL PENICILLINS

Carmine Renato Pasqualucci, Milan; Giovanni Bonfanti, Sassari; Sesto San Giovanni, Sassari, and Giorgio Cignarella, Sassari, all of Italy, assignors to Archifar Industrie Chimiche del Trentino S.p.A., Rovereto (Irento), Italy

Filed June 12, 1972, Ser. No. 262,123

Claims priority, application Italy, June 25, 1971, 26279/71

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **3 Claims**

1. A method for preparing D(−)-a-aminobenzylpenicillin directly from natural penicillins, comprising the steps of:

mixing a natural penicillin selected from a group consisting of benzylpenicillin, phenoxymethylpenicillin, and combinations of benzylpenicillin and phenoxymethylpenicillin in a solvent selected from a group consisting of methylene chloride, chloroform, acetone, and combinations of methylene chloride, chloroform and acetone;

adding to the mixture an alkychlorosilane selected from the group consisting of dimethyldichlorosilane and trimethylchlorosilane, and a tertiary base selected from the group consisting of dimethylaniline and quinoline to esterity said natural penicillin;

adding to the mixture containing esterified penicillin phosphorous pentachloride to transform the esterified penicillin into the corresponding iminochloride;

adding to the mixture containing the iminochloride a primary alcohol selected from the group consisting of methyl alcohol and butyl alcohol to transform the iminochloride into an imidate;

adding acetone to the mixture containing the imidate;

reacting the imidate in the mixture at a temperature range from −50°C to −15°C simultaneously with water and acid

chloride of phenylglycine hydrochloride at a pH between 1 and 2; and

adding a large excess of water to hydrolyze the ester.

3,872,089

SUBSTITUTED THIENODIAZEPINES

Otto Hromatka, and Dieter Binder, both of Vienna, Austria, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed May 5, 1972, Ser. No. 250,701

Claims priority, application Switzerland, May 14, 1971, 7303/71; Mar. 29, 1972, 4664/72

Int. Cl. C07d *53/02, 63/18*

U.S. Cl. 260—239.3 T **4 Claims**

1. A compound of the formula 7-chloro-1,3-dihydro-5-(o-nitrophenyl)-2H-thieno[2,3-e][1,4]diazepin-2-one.

3,872,090

3-(AMINO-METHYLENE)-5-PHENYL-1,4-BENZODIAZEPIN-2-ONES

Helmut Pieper; Gerd Kruger; Johannes Keck, all of Biberach, Riss; Klaus-Reinhold Noll, Wart Hausen-Oberhofen, and Joachim Kahling, Biberach, Riss, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

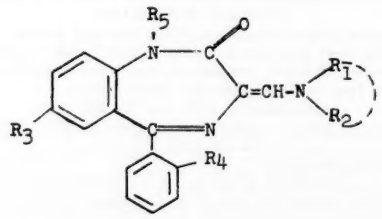
Filed July 5, 1973, Ser. No. 376,378

Claims priority, application Germany, July 12, 1972, 2234150; May 15, 1973, 2324962

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D **10 Claims**

1. A compound of the formula



wherein

R_1 and R_2 are each hydrogen cycloalkyl of 3 to 6 carbon atoms, phenyl,

—A—Y

where

A is alkyl of 1 to 5 carbon atoms or alkenyl of 1 to 5 carbon atoms, and

Y is furyl, di(lower alkyl)amino, hydroxyl, lower alkoxycarbonyl or carbamido, or, together with each other and the nitrogen atom to which they are attached, pyrrolidino, piperidino, hexamethyleneimino, morpholino, thiomorpholino, thiomorpholino-S-oxide or N'-lower alkyl-piperazino,

R_3 is halogen, nitro or trifluoromethyl,

R_4 is hydrogen, halogen or trifluoromethyl, and

R_5 is hydrogen, lower alkyl, (cycloalkyl of 3 to 6 carbon atoms)-methyl, lower alkyl-amino-lower alkyl, di(lower alkyl) amino-lower alkyl or tri-fluoromethyl-lower alkyl.

3,872,091

NEW 2β, 16β-DIAMINO-ANDROSTANES AND THEIR PREPARATION

Colin Leslie Hewett, and David Samuel Savage, both of Glasgow, Scotland, assignors to Akzona Incorporated, Asheville, N.C.

Filed Nov. 26, 1973, Ser. No. 419,001

Claims priority, application United Kingdom, Nov. 29, 1972, 55191/72

Int. Cl. C07c *173/10*

U.S. Cl. 260—239.5 **4 Claims**

1. A 2β, 16β -diamino-5α-androstane compound selected from the group consisting of said compound unsubstituted in the other positions, and said compound having as the only other substituent in 3α-position a substituent selected from the group consisting of hydroxyl and acyloxy wherein acyloxy is derived from an organic carboxylic acid having 1 to 18 carbon atoms, and the pharmaceutically acceptable acid addition salts and quaternary ammonium salts thereof.

3,872,092

NOVEL $\Delta^{9,11}$-GONADIENE-5α-OLS

Jean Georges Teutsch, Le Blanc-Mesnil, France, assignor to Roussel Uclaf, Paris, France

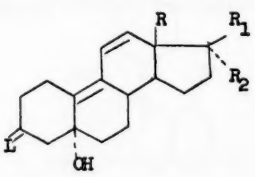
Filed Jan. 15, 1974, Ser. No. 433,569

Claims priority, application France, Jan. 29, 1973, 73.2991

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 C **5 Claims**

1. A compound having the formula



wherein R is alkyl of 1 to 4 carbon atoms, L is a ketal group, R_1 is selected from the group consisting of OH, alkoxy of 1 to 5 carbon atoms, alkenyloxy of 2 to 5 carbon atoms, acyloxy of an organic carboxylic acid of 1 to 12 carbon atoms and tetrahydropyranyloxy and R_2 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and alkenyl and alkynyl of 2 to 4 carbon atoms or R_1 may be acyl of 2 to 4 carbon atoms with the =O in its free form or blocked in the form of a ketal and R_2 is selected from the group consisting of hydrogen, —OH and acyloxy or R_1 and R_2 form a ketalized ketone.

3,872,093

NAPHTHISOXAZOLYL ALKANOIC ACIDS AND THEIR DERIVATIVES

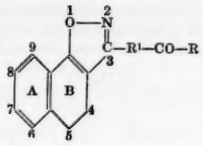
Yasushi Suzuki, Yokohama; Toshihisa Itava; Nobuyoshi, Minami, both of Kawasaki; Masaaki Tarutani; Tokutaro Miki, both of Tokyo, and Katsuhiko Myasaka, Kawasaki, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 864,163, Oct. 6, 1969, abandoned. This application Feb. 2, 1972, Ser. No. 223,009

Int. Cl. C07d *85/22*

U.S. Cl. 260—307 D **15 Claims**

1. A compound expressed by the formula:



where ring A may be substitued with 1- 2 substituents selected from the group consisting of alkoxy of up to 4 carbon atoms, alkyl of up to 4 carbon atoms, and halogen; ring B may have a carbon-to-carbon double bond between the positions of C-4 and C-5; R^1 represents methylene, and R is selected from hydroxyl, $-O(M)_{1/m}$ wherein M is a metal selected from the group consisting of alkali metals, alkaline earth metals and aluminum having a valence of 1, 2, or 3, ammonium or HZ wherein Z is a pharmaceutically acceptable, non toxic organic amine, and *m* is the valence of M, alkoxy of up to 4 carbon atoms, amino, aminoalkoxy in which alkoxy has up to 4 carbon atoms, and aminoalkyl amino in which alkyl has up to 2 carbon atoms.

3,872,094

BIS-AROXAZOLYL COMPOUNDS, PROCESSES FOR THEIR MANUFACTURE AND THEIR USE

Hans-Rudolf Meyer, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

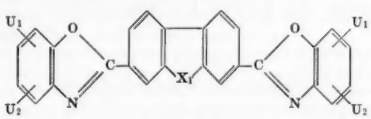
Filed Dec. 16, 1970, Ser. No. 98,869

Claims priority, application Switzerland, Dec. 17, 1969, 18853/69

Int. Cl. C07d *85/48*

U.S. Cl. 260—307 D **9 Claims**

1. A symmetrical bisaroxazolyl compound of the formula



wherein X_1 represents a bridge member $-O-$ or $-SO_2-$, U_1 denotes hydrogen, alkyl with 1 to 12 carbon atoms, chlorine, cyclohexyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl part, cyanoethyl, phenyl, alkoxy with 1 to 4 carbon atoms, and U_2 denotes hydrogen, an alkyl group with 1 to 5 carbon atoms or chlorine, and wherein furthermore U_1 together with U_2 can form a fused benzene ring.

3,872,095

N-TRITYL-IMIDAZOLES AND THEIR PRODUCTION

Karl-Heinz Buchel, Leverkusen; Erik K. Regel, Wuppertal-Kronenberg, and Manfred Piempel, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 13,797, Feb. 24, 1970, Pat. No. 3,705,172, which is a division of Ser. No. 758,594, Sept. 9, 1968, Pat. No. 3,660,577. This application Jan. 17, 1972, Ser. No. 218,520

Claims priority, application Germany, Sept. 15, 1967, 535043

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **9 Claims**

1. N-triphenyl-methyl-imidazolium lactate.

3,872,096

2-AMINOALKYL-SUBSTITUTED CYCLIC IMIDO ESTERS AND PROCESS FOR THE PREPARATION THEREOF

Helmut Witte, and Wolfgang Seeliger, both of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

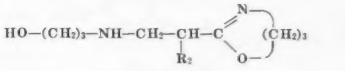
Filed Apr. 25, 1973, Ser. No. 354,462

Claims priority, application Germany, Apr. 26, 1972, 2220413

Int. Cl. C07d *85/36*

U.S. Cl. 260—307 F **5 Claims**

1. A 2-aminoalkyl-substituted cyclic imido ester of one of the formulae



wherein R_1 and R_2 each are a hydrogen atom or methyl.

3,872,097

BINUCLEAR N-HETEROCYCLIC N,N-DIGLYCIDYL COMPOUNDS, PROCESSES FOR THEIR MANUFACTURE AND THEIR USE

Juergen Habermeier, Allschwil; Dieter Baumann, Birsfelden; Daniel Porret, Binningen, and Hans Batzer, Arlesheim, all of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

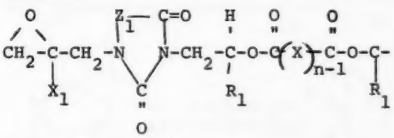
Continuation-in-part of Ser. No. 144,407, May 17, 1971, abandoned. This application Dec. 15, 1972, Ser. No. 315,396

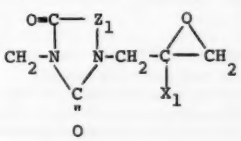
Claims priority, application Switzerland, May 22, 1970, 7627/70

Int. Cl. C07d *49/32*

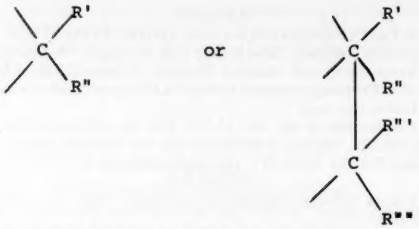
U.S. Cl. 260—309.5 **7 Claims**

1. A binclear N-heterocyclic N,N'-diglycidyl compound of the formula





(I)



wherein X_1 is hydrogen or methyl, R_1 is hydrogen, methyl, ethyl, or phenyl, X is alkylene of 1 to 4 carbon atoms, cyclohexylene, or phenylene, Z_1 is

wherein R', R'', R''' and R'''' independently of one another are hydrogen, alkyl of 1 to 4 carbon atoms or R' and R'' together are pentamethylene and *n* is 1 or 2.

3,872,098

1,N6-ETHENOADENOSINE CYCLOPHOSPHATE COMPOUNDS

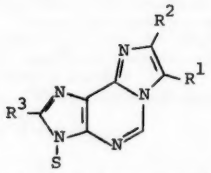
Gordon H. Jones, Cupertino, and John G. Moffatt, Los Altos, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 295,889, Oct. 10, 1972, abandoned. This application July 11, 1973, Ser. No. 378,220

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 R **21 Claims**

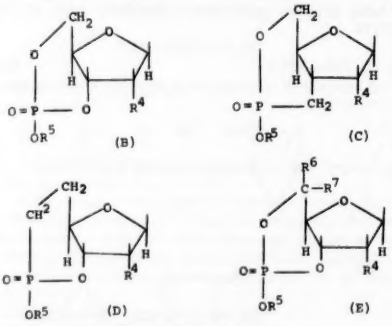
1. A compound selected from those represented by the following formula:



wherein one of R^1 and R^2 is hydrogen and the other of R^1 and R^2 is hydrogen, alkyl of from 1 to 10 carbon atoms, phenyl, substituted phenyl, or 2-naphthyl;

R^3 is hydrogen, halo, hydroxy, alkoxy, aryloxy, aralkoxy, sulfhydryl, alkylthio, arylthio, aralkylthio, azido, amino, acylamino, alkylamino, aralkylamino, dialkylamino, or diaralkylamino in which each alkyl radical contains 1 to 18 carbon atoms, each acyl radical contains 1 to 22 carbon atoms and each aralkyl radical contains 7 to 20 carbon atoms;

S is a sugar moiety selected from the group consisting of:



wherein, in each applicable formula,

R^4 is hydroxy an acyloxy radical having from 1 to 22 carbon atoms tetrahydropyran-2-yloxy, tetrahydrofuran-2-yloxy or 4-(lower)-alkoxytetrahydropyran-4-yloxy;

R^5 is hydrogen or a pharmaceutically acceptable cation; and one of R^6 or R^7 is hydrogen and the other is a lower alkyl group or R^6 and R^7 are identical lower alkyl groups.

3,872,099

METHOD OF PRODUCING ACTIVE AMINO ACID ESTERS

Naohiko Yasuda, Kawasaki; Yasuo Ariyoshi, and Koji Toi, both of Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 26, 1972, Ser. No. 317,921

Claims priority, application Japan, Dec. 27, 1971, 46-1997; Japan, Nov. 17, 1972, 47-115332

Int. Cl. C07d *27/10*

U.S. Cl. 260—326.4 **7 Claims**

1. A method of producing an amino acid ester which comprises contacting an amino acid having a masked amino group and an available carboxyl group with N-hydroxysuccinimide, in a liquid reaction medium including an amount of an isonitrile effective for causing formation of an ester from said amino acid and said compound until said ester is formed as a reaction product.

3,872,100

PROCESS FOR THE PREPARATION OF 1,3-BIS(2-PYRROLIDONYL) BUTANE

Eugene V. Hort, Piscataway, N.J., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 172,198, Aug. 16, 1971, Pat. No. 3,772,186. This application Sept. 15, 1972, Ser. No. 289,412

Int. Cl. C07d *27/08*

U.S. Cl. 260—326.25 **4 Claims**

1. A process for the preparation of 1,3-bis(2-pyrrolidonyl) butane comprising contacting 1,3-bis(2-pyrrolidonyl)-1-butene at a temperature above the melting point thereof and between about 60°C and about 160°C with hydrogen and a nickel hydrogenation catalyst at a pressure between about 100 and about 5,000 PSIG to thereby hydrogenate 1,3-bis(2-pyrrolidonyl)-1-butene to 1,3-bis(2-pyrrolidonyl) butane, the amount of catalyst employed ranging from about 0.1% to about 10% by weight based on weight of the vinyl pyrrolidone dimer and thereafter recovering the hydrogenated product.

3,872,101

SYNTHESIS OF α, β-UNSATURATED COMPOUNDS

John E. Siddall, and John H. Fried, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

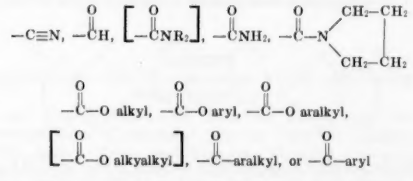
Continuation of Ser. No. 815,482, April 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 796,201, Feb. 3, 1969, abandoned. This application Jan. 19, 1973, Ser. No. 325,770

Int. Cl. C07d *27/02*; **C07c** *67/00*, *45/00*

U.S. Cl. 260—326.5 E **18 Claims**

1. A process for the stereoselective synthesis of α,β-ethylenically unsaturated compounds which comprises reacting in an anhydrous organic solvent inert to the reaction, k

a. an α,β-acetylenically unsaturated compound of the formula $R^1—C \equiv C—Q$ wherein Q is



and R^1 is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl or aralkyl, each hydrocarbon group being optionally substituted with one or more chloro, fluoro, bromo, iodo, carbonyl, acyloxy, alkoxy, cycloalkoxy, cycloalkyl, alkylenedioxy, dialkyl-amino, furyl or pyridyl groups with the proviso that there

are no carbonyl substituents immediately adjacent the β-carbon atom of the α,β-acetylenic group; with

b. an organometallic compound of the formula RCuL, R_2CuLi, or R_3MnLi, wherein L is a solubilizing ligand selected from tertiary phosphites, tertiary amines and secondary amines, and R is alkyl, alkenyl, alkynyl, cycloalkyl, aryl or aralkyl, each being optionally substituted by one or more alkyl, alkoxy, cycloalkyl, cycloalkoxy, alkylenedioxy, dialkylamino, pyridyl or furyl groups, with the proviso that any unsaturation present in R is spaced from the metal by two tetrahedral carbon atoms;

said reaction being carried out at a temperature of -40° to -100°C to give selectively cis addition of the group R to the β-carbon atom of the acetylenically unsaturated compound of the formula

wherein R^1, R and Q are as defined above.

3,872,102

TRICYCLIC COMPOUNDS OF ALIPHATIC W-AMINO ALCOHOLS

Charles Malen, Fresnes; Monique Desnos, Issy-Les-Mouleneaux, and Jean-Claude Poignani, Wissous, all of France, assignors to Societe en nom collectif Science Union et Cie, Societe Francais de Recherche Medicale, Suresnes, France

Filed Nov. 2, 1971, Ser. No. 195,036

Claims priority, application United Kingdom, Nov. 4, 1971, 52469/71

Int. Cl. C07d *93/42*

U.S. Cl. 260—327 B **7 Claims**

1. A compound selected from the group consisting of

a. 7-[dibenzo (a,d) cycloheptadien-5-yl] amino heptanol, dl-7-[8-chloro-10,10-dioxo-11-methyl dibenzo (c,f) thiazepin (1,2)-5-yl] amino heptanol, 11-[dibenzo (a,d) cycloheptadien-5-yl] amino undecanol; and

b. the hydrochloric acid addition salts thereof.

3,872,103

MANUFACTURE OF DEEP-SHADE 3,4,9,10-PERYLENETETRACARBOXYLIC ACID DIANHYDRIDE PIGMENTS

Wolfgang Fabian, Wilhelmsfeld, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Oct. 24, 1973, Ser. No. 409,091

Claims priority, application Germany, Oct. 26, 1972, 2252461

Int. Cl. C07d *9/00*

U.S. Cl. 260—333 **8 Claims**

1. A process for the manufacture of a deep-shade 3,4,9,10-perylenetetracarboxylic acid dianhydride pigment, which process comprises:

grinding the initial pigment in dry crude form until its average primary particle size is 0.01 to 1μ;

then treating the resulting ground pigment at a temperature of from 50° to 200° C. with a liquid consisting essentially of a swelling agent selected from the group consisting of primary or tertiary aromatic amines which are liquid at the treatment temperature, dimethyl formamide, N-methyl-pyrrolidone, dimethylsulfoxide, acetonitrile or acrylonitrile, the ratio of said ground pigment to swelling agent being from 1:0.5 to 1:5 parts by weight, said treatment being carried out for a period of time sufficient for the pigment to acquire approximately its optimum color strength; and

removing the swelling agent from the thus treated pigment.

3,872,104

PROPARGYL ETHERS COMPOSITIONS CONTAINING THEM AND A METHOD OF COMBATING SOIL FUNGI

Henry Martin, Basel; Otto Rohr, Therwil, both of Switzerland, and Georg Pissiotas, Lorrach, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

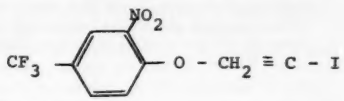
Division of Ser. No. 265,367, June 22, 1972, Pat. No. 3,830,849, which is a continuation-in-part of Ser. No. 89,528, Nov. 13, 1970, abandoned. This application June 10, 1974, Ser. No. 477,875

Claims priority, application Switzerland, Nov. 26, 1969, 17574/69

Int. Cl. A01n *9/24*

U.S. Cl. 424—340 **2 Claims**

1. A fungicidal composition for application to the sail comprising a fungicidally active amount of the compound of the formula



and a suitable carrier.

3,872,105

DERIVATIVES OF 1,3-BENZODIOXOLE-2-CARBOXYLIC ACID

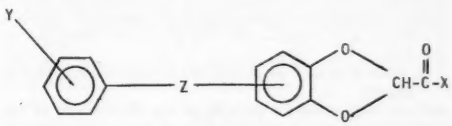
J. Martin Grisar; Roger A. Parker, and Takashi Kariya, all of Cincinnati, Ohio, assignors to Richard-Merrell Inc., New York, N.Y.

Filed June 11, 1973, Ser. No. 368,723

Int. Cl. C07d *13/10*

U.S. Cl. 260—340.5 **5 Claims**

1. A 1,3-benzodioxole-2-carboxylic acid derivative having the formula:



in which X is selected from the group consisting of hydroxy and lower alkoxy having from one to four carbon atoms; Y is selected from the group consisting of hydrogen, halogen, lower alkyl having from one to four carbon atoms and trifluoromethyl; Z is selected from the group consisting of a sigma bond, oxygen, lower alkylidene having from one to six carbon atoms, cycloalkylidene having from four to six carbon atoms and which when taken together with and adjacent to the group Y is selected from the group of cyclic radicals consisting of $-(CH_2)_3-$, $-(CH_2)_4-$ and $-(CH_2)_5-$; and the pharmaceutically acceptable acid addition salts thereof.

3,872,106

COUMARINIMIDES

Werner Koch, Oberwil, Basel Land, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

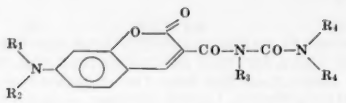
Filed Feb. 12, 1973, Ser. No. 331,974

Claims priority, application Switzerland, Feb. 15, 1972, 2182/72

Int. Cl. C07d *7/26*

U.S. Cl. 260—343.2 R **12 Claims**

1. A compound of the formula



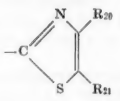
in which

R_1 is substituted or unsubstituted alkyl, or mono- or disubstituted or unsubstituted phenyl

R_2 is hydrogen, substituted or unsubstituted alkyl, or mono- or disubstituted or unsubstituted phenyl

R_3 is hydrogen, acyl, substituted or unsubstituted alkyl, or mono- or disubstituted or unsubstituted phenyl, and

R_4 R_5 are the same or different and are hydrogen, acyl, substituted or unsubstituted alkyl, mono- or disubstituted or unsubstituted phenyl, or a heterocyclic radical selected from the group consisting of a thienyl radical and a radical of formula



in which

each of R_{20} and R_{21} is a hydrogen atom or

both R_{20} and R_{21} together signify a phenyl ring or a phenyl ring substituted by an alkoxy group,

any substituent on substituted alkyl is chlorine, bromine, alkoxy, hydroxyl, cyano, acyl, acyloxy, phenylamino, N-phenyl-N-alkylamino, alkylamino, acylamino, dialkylamino, amino, vinyl, thiocyano, phenyl or phenoxy; any substituent on substituted phenyl is chlorine, bromine, alkyl, alkoxy, acyl, acyloxy, hydroxyl, cyano, thiocyano, vinyl, amino, nitro, alkylamino, dialkylamino, phenylamino, N-phenyl-N-alkylamino, acylamino, phenyl or phenoxy; any acyl substituent or acyl portion of acyloxy or acylamino is of the formula R—OCO—, R—SO_2—, R—O—SO_2—, R′—NR′SO_2—, R′—NR′CO— or R′—CO—

in which R is alkyl or phenyl and R′ is hydrogen, alkyl or phenyl;

and any alkyl group for R_1 to R_5 or any alkyl moiety of any substituent on substituted phenyl or alkyl contains one to six carbon atoms.

3,872,107

DIFLUOROMETHYLENE SUBSTITUTED PROSTAGLANDIN INTERMEDIATES

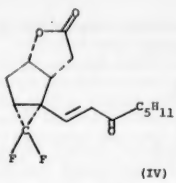
Pierre Crabbe, Mexico City, Mexico, assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 287,333, Sept. 8, 1972, abandoned. This application Mar. 12, 1974, Ser. No. 450,353

Int. Cl. C07d *5/40*

U.S. Cl. 260—343.3 **4 Claims**

1. A compound selected from the group of isomers and racemic mixtures thereof having the formulas:



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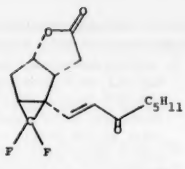


(V)

3,872,108

NOVEL CHROMONE DERIVATIVES AND THE PRODUCTION THEREOF

Akira Nohara Ukyo; Tomonobu Umetani; Yoshibumi Miyata, and Yasushi Sanno, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

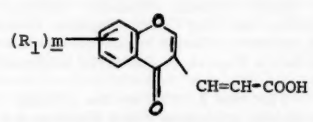
Filed Nov. 1, 1972, Ser. No. 302,652

Claims priority, application Japan, Nov. 4, 1971, 46-87880

Int. Cl. C07d *7/52*

U.S. Cl. 260—345.2 **28 Claims**

1. A compound of the formula:



wherein m is 0, 1 or 2 and each of R_1 is a member selected from the group consisting of halogen, hydroxy, nitro, amino, lower alkylamino, lower alkyl, lower alkoxy, alkanoyloxy and benzoyloxy and the pharmaceutically acceptable salts thereof.

3,872,109

SUBSTITUTED 2-PYRONES

Harald Furrer, Frankfurt am Main, and Gerhard Lohaus, Kelkheim/Taunus, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Brüning, Frankfurt/Main, Germany

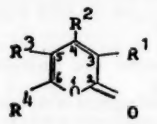
Filed Feb. 27, 1974, Ser. No. 446,289

Claims priority, application Germany, Mar. 1, 1973, 2310306

Int. Cl. C07d *7/16*

U.S. Cl. 260—343.5 **8 Claims**

1. A substituted 2-pyrone having the formula



I

wherein

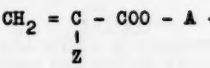
R_1 represents hydrogen, alkyl having from 1 to 4 carbon atoms, or halogen;

R_2 represents alkyl having from 1 to 4 carbon atoms,

R_3 represents hydrogen, alkyl having from 1 to 4 carbon atoms, or halogen;

R_4 represents alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 5 to 8 carbon atoms or phenyl optionally substituted by chlorine atoms or methyl groups;

and one single radical among the radical R_1, R_3 and R_4 represents the group



II

in which Z stands for hydrogen or methyl and A for straight-chain or branched alkylene having from 1 to 6 carbon atoms.

3,872,110
METHOD OF PREPARING HYDROHALIDES OF ASPARTIC ANHYDRIDE

Yasuo Ariyoshi, Yokohama; Tetsuo Yamatani; Noboru Uchiyama, both of Kawasaki; Naotake Sato, Tokyo, and Koji Toi, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 24, 1972, Ser. No. 246,781
Claims priority, application Japan, Apr. 28, 1971, 46-28317
Int. Cl. C07c *55/02*
U.S. Cl. 260—346.8 R **12 Claims**

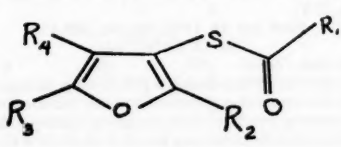
1. In a method of converting aspartic acid to the hydrochloride or hydrobromide of aspartic acid anhydride by reacting said aspartic acid in a liquid medium with a chlorine or bromine bearing dehydrating agent capable of forming hydrogen chloride or hydrogen bromide by reaction with said aspartic acid, the improvement which consists in the presence in said liquid medium of at least one mole of a monocarboxylic, unsubstituted alkanoic acid per mole of said aspartic acid, said alkanoic acid having not more than five carbon atoms in the molecule thereof, said medium, prior to said reacting, being free of components other than said alkanoic acid and capable of reacting with said aspartic acid, said dehydrating agent, and said hydrochloride or hydrobromide of aspartic anhydride.

3,872,111
ESTERS OF 3-FURANTHIOLS

William J. Evers, Atlantic Highlands; Howard H. Heinsohn, Jr., Hazlet, and Bernard J. Mayers, Cliffwood Beach, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 7, 1973, Ser. No. 386,453
Int. Cl. C07d *5/14*
U.S. Cl. 260—347.2 **22 Claims**

1. An ester of 3-furan-thiol having the structure:



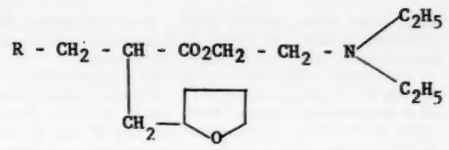
wherein R_1 is C_1–C_7 straight chain or branched chain alkyl or alkenyl; or R_1 is either of furyl, thienyl, toluyl, phenyl ethenyl or phenyl; wherein each of R_2, R_3 and R_4 is the same or different hydrogen or lower alkyl.

3,872,112
TETRAHYDROFURFURYL AMINOESTERS

Etienne Szarvasi, Charbonnieres-les-Bains, France, assignor to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyon, France

Filed July 27, 1972, Ser. No. 275,638
Claims priority, application France, July 29, 1971, 71.27823
Int. Cl. C07d *5/04*
U.S. Cl. 260—347.5 **6 Claims**

1. A tetrahydrofurfuryl aminoester of formula



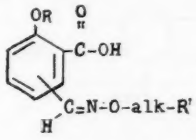
wherein R is the 2-naphthyl radical substituted in the 6-position with lower alkoxy.

3,872,113
HYDROXY- AND ACETOXY-PHTHALALDEHYDRIC, ACID, O-(SUBSTITUTED) OXIMES

Leonard J. Fliedner, Jr., Point Lookout, N.Y., assignor to Endo Laboratories, Inc., Garden City, N.Y.

Continuation-in-part of Ser. No. 257,642, May 30, 1972, abandoned. This application Apr. 19, 1973, Ser. No. 352,739
Int. Cl. C09b *23/00;* **C07c** *63/06, 69/14*
U.S. Cl. 260—240 G **12 Claims**

1. Compound of the formula



where

R is hydrogen or acetyl;

R′ is phenyl, morpholino, or phenyl substituted with 1 or 2 substituents individually selected from Cl, F, Br, NO_2, CF_3, methoxy, and ethoxy; and

alk is alkylene of one, two, or three carbon atoms, provided that, when R′ is morpholino, alk is ethylene, or propylene;

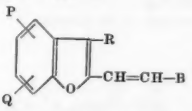
and their pharmaceutically suitable salts.

3,872,114
BENZOFURANE DERIVATIVES, PROCESS FOR THEIR MANUFACTURE AND THEIR USE AS OPTICAL BRIGHTENERS

Wilfried Sahm, Kelkheim, Taunus; Erich Schinzel, Hofheim, Taunus, and Gunter Rosch, Altenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellshaft, Frankfurt, Main, Germany

Continuation-in-part of Ser. No. 223,771, Feb. 4, 1972, abandoned. This application July 9, 1973, Ser. No. 377,277
Claims priority, application Germany, Feb. 5, 1971, 2105305
Int. Cl. C09b *23/14*
U.S. Cl. 260—240 D **18 Claims**

1. A compound of the formula



in which P and Q are hydrogen, halogen, lower alkyl, lower alkoxy or phenyl or, together, alkylene of 3 or 4 carbon atoms or an annellated phenyl nucleus; R is hydrogen or lower alkyl and B is an aromatic radical selected from the group consisting of phenyl, naphthyl, furanyl or thienyl which aromatic radical is unsubstituted or substituted by up to three substituents selected from the group consisting of halogen, lower

alkyl, lower alkoxy, phenyl, amino, lower alkylamino, di-(lower alkyl) amino, tri-(lower alkyl) ammonium, lower alkanoyl amino, cyano and a group of the formula

$-COOR^1$, $-SO_2OR^1$, $-CO\text{-}NR^2R^3$ or $SO_2NR^2R^3$

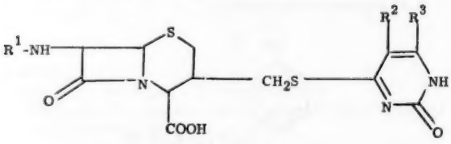
wherein R^1 is hydrogen, alkyl of 1 to 20 carbon atoms, lower alkyl substituted by hydroxy, lower alkoxy, di-(lower alkyl)-amino or tri-(lower alkyl)-ammonium; and R^2 and R^3 are hydrogen, lower alkyl or lower alkyl substituted by di-(lower alkyl)-amino or tri-(lower alkyl)-ammonium.

3,872,115
CEPHALOSPORINS

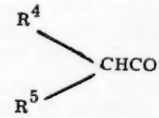
Keiichi Sugimoto, Kawanishi; Kunio Kobayashi; Kouji Nishijima, both of Osaka, and Shiro Morimoto, Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed May 31, 1972, Ser. No. 258,177
Claims priority, application Japan, May 31, 1971, 46-38007
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **30 Claims**

1. A compound of the formula



wherein R^1 is an acyl group of the formula,



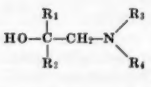
wherein R^4 is phenyl, phenoxy, cyclohexenyl, thienyl, phenylthio, 3-amino-3-carboxypropyl, cyano, tetrazolyl, or cyclohexyl group; and R^5 is hydrogen, amino, carboxyl, sulfo, carbamoyl, halogen or hydroxy group, R^2 and R^3 represent hydrogen, a alkyl group having one to four carbon atoms, carboxylic group, amino group, dimethylamino group, or hydroxymethyl group, respectively, or R^2 and R^3 may be bonded to form —NH—CH=N— group or a salt thereof.

3,872,116
AMINO ALCOHOLS

Robert M. Gipson, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed June 16, 1972, Ser. No. 263,552
Int. Cl. C07d *87/32*
U.S. Cl. 260—247.7 A **11 Claims**

1. An amino alcohol of the formula



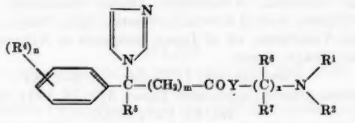
wherein R_1 and R_2 are C_4 to C_{18} alkyls and R_3 and R_4 are selected from methyl, ethyl, hydroxyethyl, hydroxypropyl, aminoethyl, aminopropyl or benzyl or one of R_3 and R_4 is hydrogen.

3,872,117
PHENYL-IMIDAZOLYL ACETIC ACID AMINO ALKANOL ESTERS AND AMIDES

Werner Meiser; Carl Metzger; Karl Heinz Buchel, and Manfred Plempel, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 30, 1971, Ser. No. 139,284
Claims priority, application Germany, May 6, 1970, 2022206
Int. Cl. C07d *87/42*
U.S. Cl. 260—247.2 B **13 Claims**

1. A compound of the formula:



wherein

R^1 and R^2 when taken independently of one another are hydrogen or (lower)alkyl of one to three carbon atoms, or when taken together with the nitrogen atom to which they are attached are morpholino;

R^4 is hydrogen, (lower)alkyl of one to three carbon atoms, (lower)alkoxy of one to three carbon atoms, halogeno, or nitro;

R^5 is lower alkyl of one to four carbon atoms or phenyl unsubstituted or substituted by one (lower)alkyl of one to three carbon atoms, (lower)alkoxy of one to three carbon atoms, halogeno, or nitro group;

each of R^6 and R^7, independent of the other, is hydrogen or of one to three carbon atoms;

Y is oxygen or —NH—;

n is 1;

m is 0; and

x is an integer from 2 to 6;

or a nontoxic acid addition salt thereof.

3,872,118
PREPARATION OF SODIUM DICHLOROISOCYANURATE DIHYDRATE COMPOSITION

Sidney Berkowitz, Highland Park, and Raymond Mesiah, Somerset, both of N.J., assignors to FMC Corporation, New York, N.Y.

Filed July 18, 1973, Ser. No. 380,459
Int. Cl. C07d *55/38*
U.S. Cl. 260—248 C **6 Claims**

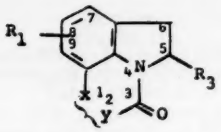
1. A process for producing a free-flowing, storage-stable, thermal-decomposition resistant sodium dichloroisocyanurate-containing product which comprises mixing sodium dichloroisocyanurate containing less than about 11% by weight water of hydration, and no more than stoichiometric amounts of a hydrated salt that will react to convert the sodium dichloroisocyanurate to its dihydrate, heating the mixture from ambient temperature to 70°C to obtain an exothermic reaction, maintaining the temperature between ambient and 70°C until the exothermic reaction subsides, and recovering a product mixture of sodium dichloroisocyanurate containing from 11% to 14.1% by weight water of hydration and the residue of the hydrated salt.

3,872,119
1-SUBSTITUTED-5,6-DIHYDRO-PYRROLO(3,2,1-IJ)QUINAZOLIN-3(3H)-ONES

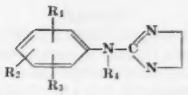
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Filed Mar. 26, 1973, Ser. No. 344,736
Int. Cl. C07d *57/12*
U.S. Cl. 260—251 A **9 Claims**

1. A compound of the formula



(I)



wherein $\widehat{x\ y}$ is

or

R_1 is hydrogen, mono- or dialkylamino in which the alkyl group contains 1 to 3 carbon atoms, halo of atomic weight 18 to 80, amino, nitro, alkyl or alkoxy of 1 to 3 carbon atoms or trifluoromethyl,

R_2 is pyridyl or phenyl and may be mono- or disubstituted by halo of atomic weight 18 to 80, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, alkoxy carbonyl in which the alkoxy group contains 1 to 3 carbon atoms or trifluoromethyl,

R_3 is hydrogen, or alkyl of 1 to 5 carbon atoms.

3,872,120

PROCESS FOR THE PREPARATION OF 1,3-DIALKANOYL HEXAHYDROPYRIMIDINE

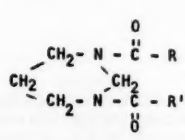
Robert R. Mod; Frank C. Magne; Gene Sumrell, all of New Orleans; Arthur F. Novak, Baton Rouge, all of La., and James M. Solar, Lubbock, Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 154,698, June 18, 1971, abandoned. This application Mar. 4, 1974, Ser. No. 448,426

Int. Cl. C07d *57/28, 57/30*

U.S. Cl. 260—251 R **2 Claims**

1. A process for preparing a compound represented by the formula



where R and R′ are monovalent organic radicals, which process comprises reacting N,N′-propylenebisamide with formaldehyde in the presence of a strong acid catalyst.

3,872,121

2-(PHENYL-AMINO-2-IMIDAZOLINES AND SALTS THEREOF

Werner Kummer; Helmut Stahle; Herbert Koppe, all of Ingelheim am Rhine, and Wolfgang Hoefke, Budenheim, all of Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhine, Germany

Filed Apr. 30, 1973, Ser. No. 355,412

Claims priority, application Germany, Apr. 28, 1972, 2220906

Int. Cl. C07d *57/00*

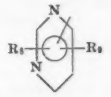
U.S. Cl. 260—256.4 N **4 Claims**

1. A compound of the formula

wherein

R_1, R_2 and R_3 are each hydrogen, fluorine, chlorine, bromine, methyl, ethyl, ethoxy, trifluoromethyl or cyano, and

R_4 and R_5, which must be different, are hydrogen or



where

R_8 and R_9 are each hydrogen, halogen, methyl or nitro,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,872,122

11 H-PYRIMIDO[4,5-b][1,4]BENZODIAZEPINES

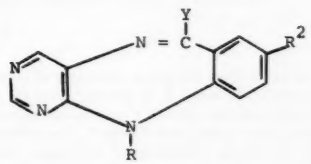
Peter Frederick Juby, Jamesville, and Thomas William Hudyma, Manlius, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,217

Int. Cl. C07d *57/02*

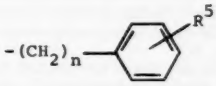
U.S. Cl. 260—256.4 F **4 Claims**

1. The compound having the formula



Ia

in which Y is di(lower)alkylamino, cyclo(lower)alkylamino, benzylamino, phenethylamino, or di(lower)alkylamino (lower)alkylamino; R is H, (lower)alkyl or a radical of the formula



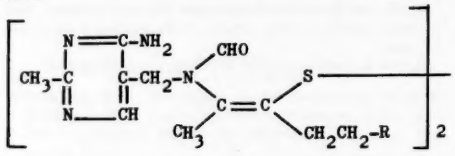
in which *n* is an integer of 1 to 4 and R^5 is chloro, CF_3, H, fluoro, bromo, (lower)alkoxy or (lower)alkyl; R^2 is H, chloro, bromo, fluoro, (lower)alkyl, CF_3, (lower)alkoxy or nitro; or a pharmaceutically acceptable nontoxic salt thereof.

3,872,123
CERTAIN THIAMINE DISULFIDE COMPOUNDS

Akira Takamizawa, Osaka; Kentaro Hirai, Kyoto; Hiroshi Oikawa, Kusatsu, and Kunihei Inazu, Suita, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Sept. 26, 1972, Ser. No. 292,454
Claims priority, application Japan, Oct. 4, 1971, 46-77774
Int. Cl. C07d *51/42*
U.S. Cl. 260—256.5 B 3 Claims

1. Thiamine disulfide compounds represented by the formula:



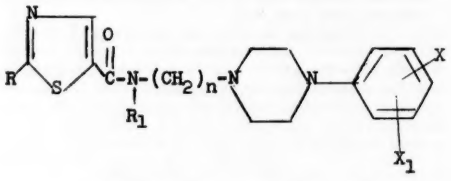
wherein R represents an alkylthio group containing 1 to 4 carbon atoms or an alkylsulfinyl group containing 1 to 4 carbon atoms, or their pharmaceutically acceptable acid-addition salts.

3,872,124
N-[4-(PHENYL)-PIPERAZINO]ALKYL-THIAZOLE-5-CARBOXAMIDES

Odile Le Martret, Paris, and Francois Clemence, Rosny-sous-Bois, both of France, assignors to Roussel UCLAF, Paris, France

Filed Mar. 12, 1973, Ser. No. 340,289
Claims priority, application France, Mar. 22, 1972, 72.10010
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 PH 8 Claims

1. A compound selected from the group consisting of thiazolcarboxamides of the formula



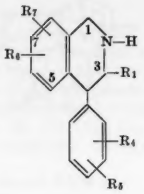
wherein R is selected from the group consisting of alkyl of 1 to 6 carbon atoms and phenyl, R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, *n* is a whole number from 2 to 5 and X and X_1 are individually selected from the group consisting of hydrogen, halogen, trifluoromethyl and alkyl, alkoxy and alkylthio of 1 to 4 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

3,872,125
3-SUBSTITUTED-4-ARYL ISOQUINOLINES

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 339,616, March 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 259,860, June 5, 1972, abandoned. This application Oct. 30, 1973, Ser. No. 411,074
Int. Cl. C07d *33/34*
U.S. Cl. 260—283 R 2 Claims

1. A compound of the formula



(I)

where

R_1 represents

where

R_2 and R_3 are each, independently, methyl or ethyl, or R_2 and R_3 together represent $(CH_2)_n$

where

n represents 4, 5 or 6,

and

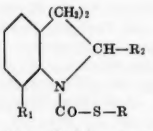
R R_4, R_5, R_6 and R_7 each, independently, represent hydrogen, halo of atomic weight 19–36, trifluoromethyl, lower alkyl having 1–4 carbon atoms, or lower alkoxy having 1–4 carbon atoms, provided that R_6 and R_7 may not represent said lower alkyl at the 8-position, and provided further that two trifluoromethyl groups or two tertiary butyl groups or a trifluoromethyl group and a tertiary butyl group are not on adjacent carbon atoms and the pharmacologically acceptable acid addition salts thereof.

3,872,126
1-(CHLOROALKYLTHIO-CARBONYL)-DECAHYDROQUINOLINES

Elmar Sturm, Arlesheim; Hans Joerg Cellarius, Riehen, and Christian Vogel, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 216,778, Jan. 10, 1972, Pat. No. 3,776,912. This application Sept. 10, 1973, Ser. No. 395,883
Claims priority, application Switzerland, Jan. 14, 1971, 553/71
Int. Cl. C07d *33/60*
U.S. Cl. 260—283 S 3 Claims

1. A compound of the formula



wherein R is mono chloroalkyl having two or three carbon atoms; and one of R_1 and R_2 is hydrogen and the other is hydrogen or methyl.

3,872,127
N-(FURYL- OR THIENYL-METHYL)-14-OXY-7,8-DIHYDRO-NORMORPHINONES AND -NORCODEINONES AND SALTS THEREOF

Herbert Merz; Adolf Langbein; Gerhard Walther, and Klaus Stockhaus, all of Ingelheim am Rhine 1, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhine, Germany

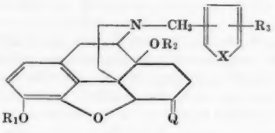
Filed Aug. 6, 1973, Ser. No. 386,065

Claims priority, application Germany, Aug. 7, 1972, 2238839

Int. Cl. C07d *43/28*

U.S. Cl. 260—285 **10 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, methyl or acetyl,

R_2 is hydrogen or acetyl,

R_3 is hydrogen or methyl,

Q is oxygen, dimethoxy, diethoxy, ethylenedioxy or propylene(1,3)dioxy, and

X is oxygen or sulfur,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,872,128
ANTIMICROBIAL HYDROXY QUINOLINE, ETHYLENE-CRYLIC POLYMER COMPOSITIONS

Joseph S. Byck, Middlesex, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 8, 1972, Ser. No. 232,970

Int. Cl. C07d *33/38*

U.S. Cl. 260—286 R **7 Claims**

1. Antimicrobial ammonium salt composition consisting of:

a. cations of a quinoline selected from the group consisting of 5-formyl-8-hydroxyquinoline, 7-bromo-5-formyl-8-hydroxyquinoline, 5-benzoyl-8-hydroxyquinoline, 8-hydroxyquinoline, 2-methyl-8-hydroxyquinoline, 2-methyl-6-hydroxyquinoline, 5-ethyl-8-hydroxyquinoline, 8-acetoxyquinoline, 5-acetyl-8-hydroxyquinoline, 5-chloro-7-iodo-8-hydroxyquinoline, 5,7-dichloro-2-methyl-8-hydroxyquinoline, 5-nitro-8-hydroxyquinoline, and 7-iodo-5-nitro-8-hydroxyquinoline, and

b. anions of a normally solid copolymer of ethylene and acrylic or methacrylic acid having polymerized therein a major amount of ethylene.

3,872,129
PROCESSES AND INTERMEDIATES FOR QUININE, QUINIDINE, ISOMERS AND DERIVATIVES THEREOF

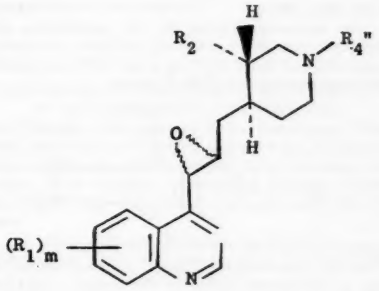
Juerg Albert Walter Gutzwiller, Bettingen, Switzerland, and Milan Radoje Uskokovic, Upper Montclair, N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 212,774, Dec. 27, 1971, Pat. No. 3,772,302, which is a continuation-in-part of Ser. No. 104,784, Jan. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 837,354, June 27, 1969, abandoned, which is a continuation-in-part of Ser. No. 741,914, July 2, 1968, abandoned. This application Aug. 1, 1973, Ser. No. 384,766

Int. Cl. C07d *33/50*

U.S. Cl. 260—288 R **2 Claims**

1. A compound of the formula



wherein *m* is 0, 1 or 2; R_1 is hydrogen, hydroxy, chloro, trifluoromethyl, methyl, methoxy, ethyl, propyl or butyl or when m is 2, R_1 taken together with an adjacent R_1, is also methylenedioxy; and R_2 is vinyl or ethyl; and R_4'' is hydrogen, lower alkanoyl of 1-7 carbon atoms, or phenyllower alkanoyl of 1–7 carbon atoms; its antipode or racemate.

3,872,130
1-HYDROXYISOQUINOLONES

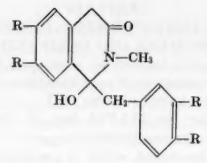
William Eugene Kreighbaum, and William Timmey Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 184,197, Sept. 27, 1971, Pat. No. 3,798,225. This application Nov. 23, 1973, Ser. No. 418,710

Int. Cl. C07d *33/38*

U.S. Cl. 260—289 R **3 Claims**

1. A compound selected from the group of 6,7-dialkoxy-1-hydroxy-2-methyl-3(2H)-isoquinolines having the formula



Formula I

wherein R is lower alkoxy from 1 to 4 carbon atoms inclusive.

3,872,131

METHOD OF PREPARING QUINOPHTHALONE DYES

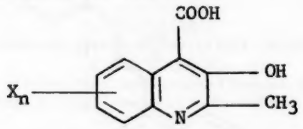
William E. Wallace, Rensselaer, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Oct. 1, 1971, Ser. No. 185,880

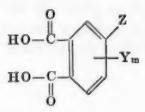
Int. Cl. C07d *33/48*

U.S. Cl. 260—289 QP **15 Claims**

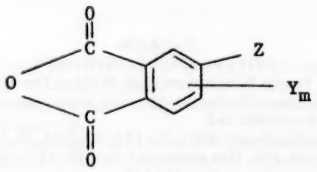
1. An improved process for the preparation of 3'-hydroxyquinophthalones consisting essentially of reacting, at a temperature of about 180°C to about 220°C, a 2-methyl-3-hydroxycinchoninic acid of the formula:



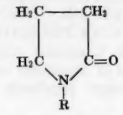
wherein X is a member taken from the group consisting of H; Cl; Br; Fl; CH_3; methoxy; ethoxy; propoxy; butoxy; nitro; cyano; a sulfonamide group of the formula $—SO_2NR_1R_2$, wherein said R_1 and R_2 are taken from the group consisting of H, methyl, ethyl, and butyl; and an acylamido group of the formula $—CONR_1R_2$, wherein R_1 and R_2 are as described above, and n is 0 or an integer of from 1 to 4 except that n is 1 or 0 when X is nitro, cyano, sulfonamido or acylamido, with an acid taken from the group consisting of (a) an aryl polycarboxylic acid of the formula:



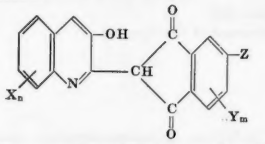
wherein Z is hydrogen or —COOH except that Z is hydrogen when Y is sulfonamido or acylamido and Y and m are the same as X and n, respectively, as above, only one of said X and Y being said cyano, substituted sulfonamide or acylamide; (b) an aryl polycarboxylic acid anhydride of the formula:



wherein Z, Y and m are the same as above with respect to said aryl polycarboxylic acid, only one of said X and Y being said cyano, substituted sulfonamide or acylamido; and (c) mixtures thereof, said reaction being carried out in the presence of an N-substituted lower alkyl pyrrolidone solvent having the formula:



wherein R is a lower alkyl group having about 1–7 carbon atoms, the resulting product formed in the reaction mixture having the formula:



wherein X, Y, m, n, R_1 and R_2 are as described above, whereby the presence of said pyrrolidone solvent serves to render the reaction mixture readily stirrable during the desired reaction operation, the resulting product being conveniently precipitated therefrom in the isolation of said product in high yields as disperse dyestuffs of high purity and quality.

3,872,132

PROCESS FOR THE MANUFACTURE OF SIGNAL DYES OF THE CATIONIC SERIES

Stefan Koller, Pratteln; Rudolf Zink, Oberwil Basel-land; Dieter Reichel, Kuessnacht am Rigi, and Jacques Voltz, Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

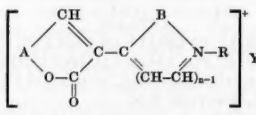
Filed Aug. 23, 1971, Ser. No. 174,156

Claims priority, application Switzerland, Aug. 26, 1970, 12749/70

Int. Cl. C07d *7/34*

U.S. Cl. 260—296 B **8 Claims**

1. A process for the manufacture of fluorescent cationic compounds of the 1,2-pyran series of the formula I

(I) 

in which:

A represents a bivalent aromatic residue which is linked in the O-position and may, if desired, be substituted,

B represents a bivalent residue as hereinafter defined,

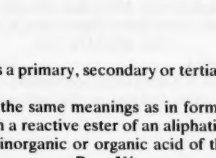
R represents an alkyl or aralkyl residue which, if desired, may be substituted,

n is 1 or 2 and when n is 2, B is a bivalent residue selected from the group consisting of vinylene or o-phenylene and when n is 1, B is a bivalent residue selected from the group consisting of butadienylene or o-styrylene and B is unsubstituted or substituted by methyl or ethyl,

Y represents the equivalent charge of an anion,

wherein a thioacetiamide compound of the formula II

(II)



in which

Am represents a primary, secondary or tertiary amino group and

B and *n* have the same meanings as in formula I

is converted with a reactive ester of an aliphatic or araliphatic alcohol with an inorganic or organic acid of the formula

$$R - Y' \qquad (III)$$

(in which R has the same meaning as in formula I and Y′ represents the acid residue corresponding to the anion Y^-) into a cycloammonium compound which latter compound is then reacted with an aromatic aldehyde, which contains a hydroxyl group in the orthoposition to the aldehyde group, to form a cationic coumarin compound of the formula I, and the starting materials are chosen so that the cationic portion of the final product does not contain any groups that undergo acid dissociation in water.

3,872,133

3-AMINO-1H-PYRAZOLO(3,4-B)PYRIDINES

Erwin Fleckenstein, Hofheim, Taunus, and Reinhard Mohr, Offenbach, Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Main, Germany

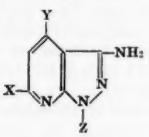
Filed June 26, 1973, Ser. No. 373,766

Claims priority, application Germany, June 30, 1972, 2232038

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 H **6 Claims**

1. A 3-amino-1H-pyrazolo [3,4-b] pyridine of the formula



(I)

wherein

X ia amino or alkylamino of 1 to 6 carbon atoms or di-lower alkylamino,

Y is lower alkyl and

Z is hydrogen.

3,872,134

PRODUCTION OF ANTHRAQUINONE

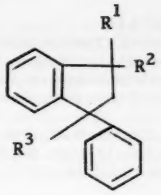
Hermann Wistuba; Michael Jolyon Sprague, both of Mannheim; Heinz Engelbach, Limburgerhof; Herbert Armbrust, and Hans-Juergen Sturm, both of Gruenstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed July 11, 1972, Ser. No. 270,673

Int. Cl. C09b *1/00*

U.S. Cl. 260—369 **8 Claims**

1. In a process for the production of anthraquinone in the gas phase in the presence of a catalyst at an elevated temperature of from 250° to 500°C wherein an indan of the formula (I):



(I)

in which R^1, R^2 and R^3 may be identical or different and each is alkyl of 1 to 4 carbon atoms, and R^1 and/or R^3 may also each be a hydrogen atom, is oxidized in the presence of a catalyst, the improvement which comprises: using a catalyst consisting essentially of a pentavalent vanadium compound, a compound of thallium and a compound of antimony with an atomic ratio of 30,000 to 10 of vanadium to 1 of thallium and of 8,000 to 3 of vanadium to 1 of antimony.

3,872,135

SEPARATION OF ANTHRAQUINONE FROM A MIXTURE OF ITS VAPOR WITH A CARRIER GAS

Helmut Reinicke, Ludwigshafen; Dieter Stockburger, Gruenstadt; Theo Teutsch, Neuhofen; Ludwig Vogel, Frankenthal; Hermann Wistuba, Mannheim, and Heinz Engelbach, Limburger, all of Germany, assignors to Badische Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed June 29, 1973, Ser. No. 375,177

Claims priority, application Germany, July 1, 1972, 2232453

Int. Cl. C09b *1/00*

U.S. Cl. 260—369 **16 Claims**

1. A process for separation of anthraquinone from a mixture of its vapor with a hot carrier gas, wherein the gas-vapor mixture at a temperature of at least 200°C is treated in a desublimation zone with an aqueous suspension of anthraquinone at a temperature below the boiling point of water at the prevailing pressure.

3,872,136

PROCESS FOR THE PREPARATION OF VANADIUM OXYCARBIDE, OXYNITRIDE AND OXYCARBONITRIDE

Servaas Middelhoek, Arnhem, Netherlands, assignor to N. V. Hollandse Metallurgische Industrie Billiton, Arnhem, Netherlands

Filed Sept. 9, 1970, Ser. No. 70,887

Claims priority, application Netherlands, Sept. 9, 1969, 6913685

Int. Cl. C01b *21/10*

U.S. Cl. 423—371 **13 Claims**

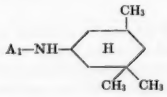
1. Process for the preparation of a material consisting mainly of at least one vanadium compound selected from the group consisting of vanadium oxy carbide, vanadium oxy nitride and vanadium oxy carbonitride, the oxygen content ranging from about 0.2 to 1.7 percent wt. having the formula: VC_xN_yO, wherein X and Y are in any desired ratio and either may be zero, except that when X is O, Y cannot be zero and conversely, comprising reacting at a temperature ranging from about 800°C to 1,250°C a solid compound defined by the formula $VO_pC_qN_z$, having an oxygen content in the range of about 7.3 to 14.9 percent by wt., wherein p and q may have any ratio to one another and z can range from 0 to 3 percent by wt., with a gas comprising from 0 to 100 volume per cent of hydrogen, 0 to 100 volume per cent of nitrogen, 0 to 100 volume per cent of ammonia, the sum of the hydrogen, nitrogen and ammonia contents constituting at least 50 volume per cent of said gas.

3,872,137
ANTHRAQUINONE COMPOUNDS

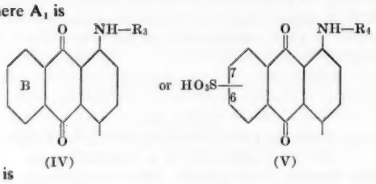
Wolfgang Frey, Munchenstein/BL, and Wolfgang Schoenauer, Riehen/BS, both of Switzerland, assignors to Fidelity Union Trust Company, Executive Trustee under Sandoz Trust of May 4, 1955

Division of Ser. No. 808,322, March 18, 1969, Pat. No. 3,646,071. This application Nov. 17, 1971, Ser. No. 199,811
Int. Cl. C09b *1/30, 1/34, 1/52*
U.S. Cl. 260—374 7 Claims

1. A compound of the formula

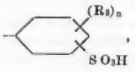


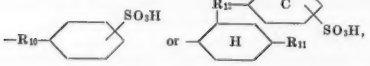
where A_1 is



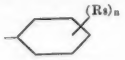
(IV) (V)

R_3 is



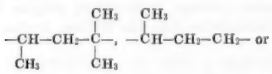


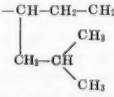
R_4 is secondary alkyl of 3 to 6 carbon atoms, cyclohexyl, 3,5,5-trimethylcyclohexyl, or



R_8 is hydrogen, lower alkyl, lower alkoxy, halogen or lower acylamino,

R_{10} is $-CH_2-$,





R_{11} is hydrogen or alkyl having 1 to 8 carbon atoms,

R_{12} is $-CH_2-$, $-CH_2-CH_2-$ or

n is 1 to 3,

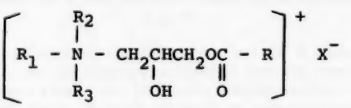
the SO_3H group in formula (V) being in the 6- or 7-position; the nucleus B bearing optionally a chlorine atom or an SO_3H group in the 6- or 7-position or two hydroxyl or amino groups or one hydroxyl and one amino group in the 5- and 9-positions, respectively; the nucleus C bearing optionally 1 to 3 lower alkyl or lower alkoxy groups; all substituents R_8 being the same or different from each other if n stands for 2 or 3, and any acylamino group being acetylamino, propionylamino, n-butyrylamino, methoxycarbonylamino or ethoxycarbonylamino.

3,872,138
PROCESS FOR THE PREPARATION OF QUATERNARY AMMONIUM SALTS

Yuzuru Ogata, Wakayama, Japan, assignor to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1972, Ser. No. 304,128
Claims priority, application Japan, Nov. 9, 1971, 46-892257
Int. Cl. C11c *1/00*
U.S. Cl. 260—404 5 Claims

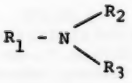
1. A process for preparing quaternary ammonium salts containing an ester linkage in the cationic moiety, of the formula



in which R is alkyl, alkenyl or cycloalkyl having 1 to 17 carbon atoms, X is halogen and each of R_1, R_2 and R_3 is alkyl or alkenyl having 1 to 18 carbon atoms

which comprises

neutralizing a carboxylic acid of the formula RCOOH with a substantially stoichiometric amount of a tertiary amine of the formula



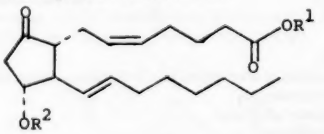
to form a salt and then reacting said salt with a stoichiometric amount or a slight excess of an epihalohydrin to form a compound of the first-mentioned formula.

3,872,139
15 DEOXY PGE_2

John W. Patterson, Mountain View, and John H. Fried, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc.

Filed May 12, 1972, Ser. No. 252,721
Int. Cl. C07c *61/36, 69/74*
U.S. Cl. 260—468 D 7 Claims

1. The dl compounds of the formulas:



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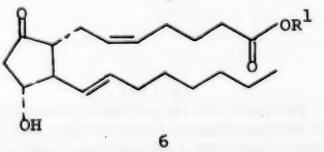

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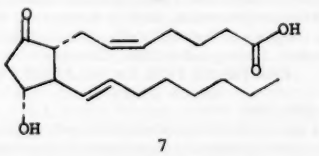


7

wherein

R^1 is lower alkyl, $-CH_2CH_2Cl$ or $-CH_2CCl_3$; and

R^2 is $-C(CH_3)_2O(CH_2)_xCH_3$, in which x is 0, 1, 2 or 3.

3,872,140

LIQUID CRYSTALLINE COMPOSITIONS AND METHOD

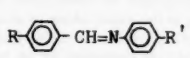
Bruce H. Klanderman, and Thomas R. Criswell, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 268,265, July 3, 1972, abandoned. This application Feb. 12, 1973, Ser. No. 331,438

Int. Cl. C09k *1/02*

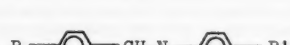
U.S. Cl. 252—408 **9 Claims**

1. A process for interconversion of Schiff bases comprising the steps of mixing together at least two different Schiff bases of the formula:



wherein R and R′ each represent a member selected from the group consisting of an alkyl radical, an alkoxy radical, an acyloxy radical, an alkoxy carbonyloxy radical and a cyano radical and heating the resultant mixture in the presence of a catalyst capable of effecting interconversion of the Schiff bases to form a mixture of different Schiff bases having all possible combinations of the selected substituents R and R′.

2. A process for interconversion of Schiff bases comprising the steps of mixing together at least two different Schiff bases of the formula:



wherein R and R′ each represent a member selected from the group consisting of an alkyl radical, an alkoxy radical, an acyloxy radical, an alkoxycarbonyloxy radical and a cyano radical and heating the resultant mixture in the presence of a catalyst capable of effecting interconversion of the Schiff bases to form a mixture of different Schiff bases having all possible combinations of the selected substituents R and R′, wherein said catalyst is selected from the group consisting of alkylamine salts, p-toluenesulfonic acid, ammonium chloride, ammonium acetate and sodium acetate.

3,872,141

1-ALKOXYCARBOXYLIC ACID DERIVATIVES FOR THE REGULATION OF PLANT GROWTH

Claus Weis, Arlesheim, and Hanspeter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 1, 1972, Ser. No. 277,013

Claims priority, application Switzerland, Aug. 3, 1971, 11390/71

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 **1 Claim**

1. 1-methoxy-dec-3-enecarboxylic acid and the allkali metal and alkaline-earth metal salts thereof.

3,872,142

METHOD OF PURIFYING ALKALI METAL SOAPS OF SYNTHETIC FATTY ACIDS

Hideomi Saito, Sagamihara; Takashi Yamashita; Takuro Munezawa, both of Yokohama, and Tetsuya Kato, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc. and Japan Carboxylic Acids Co., Ltd., both of Tokyo, Japan, a part interest to each

Filed Apr. 13, 1973, Ser. No. 350,772

Claims priority, application Japan, Apr. 20, 1972, 47-39789

Int. Cl. C11d *13/02*

U.S. Cl. 260—418 **5 Claims**

1. A method of purifying an alkali metal soap contaminated with unsaponifiable matter and prepared by oxidizing paraffin to an oxidation product essentially consisting of fatty acids substantially insoluble in water and containing said unsaponifiable matter, and holding said oxidation product under saponifying conditions, said method comprising:

a. preparing an aqueous solution of said contaminated soap and of a lower alkanol, the amount of said alkanol being 5 to 50 percent of the weight of said solution;

b. extracting said solution with ethylene dichloride until said saponifiable matter is substantially completely extracted from said solution and dissolved in said ethylene dichloride,

1. the amount of said lower alkanol being sufficient to prevent the formation of an emulsion from said aqueous solution and said ethylene dichloride; and

c. separating the extracted aqueous solution from the ethylene dichloride having said unsaponifiable matter dissolved therein.

3,872,143

PROCESS FOR THE PREPARATION OF A MIXTURE OF N-OCTYLTIN CHLORIDES WHICH IS ENTIRELY FREE FROM TRI-N-OCTYLTIN CHLORIDE

Fdyta Boboli; Wladyslaw Longin Malasnicki; Mieczyslaw Kowalski, all of Warsaw and Andrzej Pazgan, Sochaczew, all of Poland, assignors to Instytut Przemyslu Organiczego

Continuation of Ser. No. 148,882, June 1, 1971, abandoned. This application June 15, 1973, Ser. No. 370,231

Claims priority, application Poland, June 6, 1970, 141123

Int. Cl. C07f *7/22*

U.S. Cl. 260—429.7 **1 Claim**

1. A process for the preparation of a mixture of di- and mono-n-octyltin chlorides which has a high di-n-octyltin dichloride content comprising directly reacting tin, n-octyl chloride and n-octyl iodide in the presence of phosphorus trichloride as a catalyst at an elevated temperature of 175° – 200° C and simultaneously distilling off the formed alpha-octene during the course of the reaction, filtering off the unreacted tin and formed tin dichloride and distilling off from the filtrate the unreacted n-octyl chloride and n-octyl iodide, said phosphorus trichloride catalyst being present in an amount of 0.03 – 0.08 mol per 1 gram atom of tin.

3,872,144

ORGANOALUMINUM COMPOUNDS AND THEIR PREPARATION

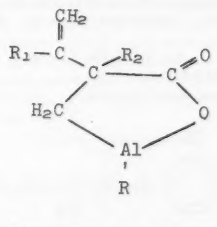
Lawrence H. Shepard, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 25, 1973, Ser. No. 409,415

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 A **30 Claims**

9. An organoaluminum compound of the formula



wherein R is a hydrocarbon group having up to about 18 carbon atoms, R_1 is hydrogen or an alkyl or alkenyl group, and R_2 is hydrogen or an alkyl group.

19. A process of preparing an organoaluminum compound possessing a 4-vinylic-(1-alumina-2-oxacyclopentan-3-one) moiety which comprises reacting (i) a nonionic organoaluminum compound possessing an aluminacyclopent-3-ene moiety, the moiety being attached by means of an aluminum-carbon bond to a hydrocarbon group which optionally may be

substituted by no more than one additional so-bonded aluminacyclopent-3-ene moiety, with (ii) carbon dioxide, the reaction being conducted in the presence of a stable Lewis base.

3,872,145

PROCESS FOR OBTAINING TRIMETHYLVINYLSILANE BY LIQUID-LIQUID EXTRACTION

Jacques Breysse, Villeurbanne; Gilbert Joseph Marin, Saint-Foy-les-Lyon, and Marcel Lefort, Caluire, all of France, assignors to Rhone-Polenc S.A., Paris, France

Filed Nov. 21, 1973, Ser. No. 417,903

Claims priority, application France, Nov. 23, 1972, 72.41637

Int. Cl. C07f *7/20*

U.S. Cl. 260—448.2 E **9 Claims**

1. A process for obtaining a trimethylvinylsilane containing less than 0.01 percent w/w of tetrahydrofuran from a mixture of trimethylvinylsilane and tetrahydrofuran, wherein the mixture of trimethylvinylsilane and tetrahydrofuran is subjected to liquid-liquid extraction using water as the solvent.

3,872,146

PROCESS OF REMOVING SULFATE GROUPS FROM ORGANOPOLYSILOXANES

Gerd Rossmy, Essen-Werden, Germany, assignor to Th. Goldschmidt AG, Essen, Germany

Filed May 22, 1974, Ser. No. 472,359

Claims priority, application Germany, June 16, 1973, 2330717

Int. Cl. C07f *7/08*

U.S. Cl. 260—448.2 E **8 Claims**

1. A process of removing sulfate groups from polysiloxanes which contain groups in which sulfate groups are intramolecularly and/or terminally linked to silicon atoms, which comprises reacting said polysiloxanes with peralkylated amides of at least one acid selected from the group consisting of carboxylic acids, phosphonic acids and phosphoric acids, whereby an SO_3-containing peralkylated acid amide phase is obtained and separating said phase.

3,872,147

1-PHENOXY-2-HYDROXY-3-ALKYLAMINO-PROPANES

Herbert Koppe; Werner Kummer; Helmut Stahle; Karl Zeile, all of Ingelheim am Rhein, and Albrecht Engelhardt, Main/-Rhine, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhine, Germany

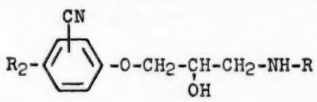
Continuation of Ser. No. 781,985, Dec. 6, 1968, abandoned. This application Dec. 2, 1971, Ser. No. 204,316

Claims priority, application Germany, Dec. 13, 1967, 1643625

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 E **3 Claims**

1. A compound of the formula



wherein

R is branched alkyl of 5 to 8 carbon atoms containing a quaternary carbon atom which is attached, directly or through an alkylene chain of 1 to 4 carbon atoms, to the amino nitrogen atom, and

R_2 is hydrogen or chlorine,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,872,148

CATALYTIC AMMOXIDATION OF PROPYLENE OR ISOBUTYLENE

Sumio Umemura; Kyoji Ohdan; Yasuo Bando, all of Ube; Mikio Hidaka, Shimonoseki, and Kazuo Fukuda, Ube, all of Japan, assignors to UBE Industries, Ltd., Ube, Yamaguchi-ken, Japan

Filed July 13, 1973, Ser. No. 378,978

Claims priority, application Japan, Aug. 4, 1972, 47-77616

Int. Cl. C07c *121/02*

U.S. Cl. 260—465.3 **5 Claims**

1. A process for the manufacture of acrylonitrile or methacrylonitrile from propylene or isobutylene, respectively, comprising contacting in the vapor phase at an elevated temperature a mixture of propylene or isobutylene, ammonia and oxygen with a catalyst consisting of an oxide composition containing the elements according to the formula

$$BiMo_aW_bII_cX_dO_e$$

wherein II is at least one metal selected from the group consisting of calcium, barium and zinc; X is a single metal selected from the group consisting of titanium, zirconium, niobium, tantalum, vanadium, chromium, manganese, iron, cobalt and nickel or a two metal combination selected from the group consisting of titanium and niobium, titanium and zirconium, chromium and titanium, chromium and zirconium and chromium and niobium; and each of the subscripts *a*, *b*, *c* and *d* denote the atomic ratio of the respective metal to bismuth and falling within the following ranges, $a = 0.3$ to 10, $b = 0.05$ to 3.0, $c = 0.1$ to 6.0 and $d = 0$ to 5.0, and e is a value corresponding to the oxides formed from the above components by combination and is a number which satisfies the average valency of the metals employed, and falls within the range of 3.2 and 61.5, said catalyst being a mixture of the metal oxides or in bonded state and being produced by intimately mixing at least one compound selected from the group consisting of the salts, the oxides, and mixtures thereof of each of respective elements in an aqueous system, heating to dryness, and then subsequently calcining at a considerably higher temperature.

3,872,149

9-HYDROXY PROSTA-5-CIS, 11,13-TRANS-TRIENOIC ACIDS AND DERIVATIVES THEREOF

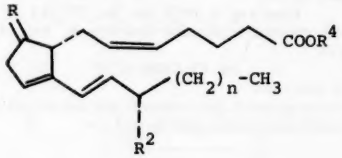
Pierre Crabbe, Grenoble, France, assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 25, 1973, Ser. No. 373,597

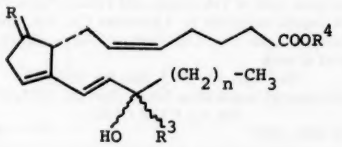
Int. Cl. C07c *61/32*

U.S. Cl. 260—468 D **16 Claims**

1. A compound selected from the group of those represented by the following formulas:



(A)



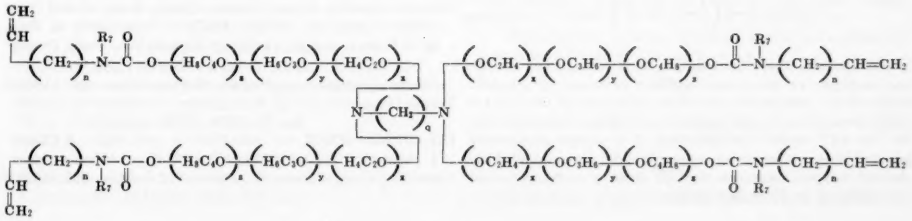
(B)

wherein
R is the grouping

in which R^1 is hydrogen, tetrahydrofuran-2-yloxy, tetrahydropyran-2-yloxy, 4-methoxytetrahydropyran-4-yloxy, a hydrocarbon carboxylic acyloxy group containing from 1 to 12 carbon atoms or a substituted hydrocarbon carboxylic acyloxy group having from 1 to 12 carbon atoms wherein the substituent is selected from the group consisting of hydroxy, alkoxy containing up to twelve carbon atoms, nitro, amino and halogen;
R^2 is hydroxy, tetrahydrofuran-2-yloxy, tetrahydropyran-2-yloxy, 4-methoxytetrahydropyran-4-yloxy, a hydrocarbon carboxylic acyloxy group containing from 1 to 12 carbon atoms or a substituted hydrocarbon carboxylic acyloxy group having from 1 to 12 carbon atoms wherein the substituent is selected from the group consisting of hydroxy, alkoxy containing up to twelve carbon atoms, nitro, amino and halogen;
R^3 is methyl, ethyl or propyl;
R^4 is hydrogen, a lower alkyl group or the pharmaceutically acceptable, non-toxic salts of compounds in which R^4 is hydrogen; n is an integer of from 2 to 9; and
the wavy lines (ξ) indicate the α or β configuration, or mixtures thereof.

3,872,150
POLYENE CARBAMATES
Clifton L. Kehr, 1216 Ednor Rd., Silver Spring, Md. 20904, and Walter R. Wszolek, Box 196, Rt. 2, Sykesville, Md. 21784
Division of Ser. No. 40,737, May 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 617,801, Feb. 23, 1967, abandoned, which is a continuation-in-part of Ser. No. 567,841, July 26, 1966, abandoned. This application Aug. 22, 1973, Ser. No. 390,664
Int. Cl. C07c *125/06*
U.S. Cl. 260—468 E **1 Claim**

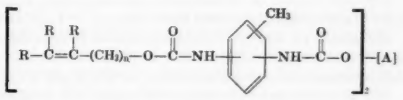
1. A polyene having the formula:



wherein q is at least 2; the sum of $x + y + z$ in each chain segment is at least 1; n is at least 1; and R_7 is a member of the group consisting of $CH_2{=}CH{-}(CH_2{+}_n$, hydrogen, phenyl, cycloalkyl and alkyl; and
wherein said alkyl having from 1 to 9 carbon atoms and said cycloalkyl having from 3 to 8 carbon atoms.

3,872,151
POLYENE CARBAMATES
Clifton L. Kehr, 1216 Ednor Rd., Silver Spring, Md. 20904, and Walter R. Wszolek, Box 196, Rt. 2, Sykesville, Md. 21784
Continuation of Ser. No. 40,737, May 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 617,801, Feb. 23, 1967, abandoned, which is a continuation-in-part of Ser. No. 567,841, July 26, 1966, abandoned. This application Aug. 22, 1973, Ser. No. 390,663
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C **3 Claims**

1. A polyene of the formula:



wherein R is a radical selected from the group consisting of hydrogen, fluorine, chlorine, phenyl, benzyl, alkyl, alkoxy, and cycloalkyl; said alkyl and alkoxy having from 1 to 9 carbon atoms and said cycloalkyl having from 3 to 8 carbon atoms;
wherein [A] is free of reactive carbon to carbon unsaturation and formed of at least two repeating units selected from the group consisting of $+CH_2{+}_a$, $+C_2H_4O{+}_b$, $+C_3H_6O{+}_k$, and $+C_4H_8O{+}_h$, g is an integer from 1 to 9 and h is an integer from 1 to 200;
said polyene having a molecular weight in the range of 300 to 20,000 and a viscosity in the range from essentially 0 to 20 million centipoises at 70°C.

3,872,152
TERMINALLY UNSATURATED LIQUID POLYENE HAVING INTERNALLY UNREACTIVE CARBON-TO-CARBON UNSATURATION

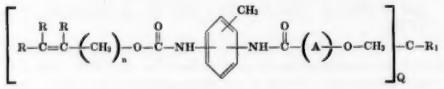
Clifton L. Kehr, 1216 Ednor Rd., Silver Spring, Md. 20904, and Walter R. Wszolek, Box 196, Rt. 2, Sykesville, Md. 21784

Continuation of Ser. No. 40,737, May 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 617,801, Feb. 23, 1967, abandoned, which is a continuation-in-part of Ser. No. 567,841, July 26, 1966, abandoned. This application Aug. 22, 1973, Ser. No. 390,666

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **3 Claims**

1. A polyene of the formula:



wherein Q is 2–3; *n* is at least 1;

wherein R is a radical selected from the group consisting of hydrogen, fluorine, chlorine, phenyl, benzyl, alkyl, alkoxy and cycloalkyl; said alkyl and alkoxy having from 1 to 9 carbon atoms and said cycloalkyl having from 3 to 8 carbon atoms;

wherein [A] is free of reactive carbon to carbon unsaturation and formed of at least two repeating units selected from the group consisting of $+CH_2+_g$, $+C_2H_4O+_h$, $+C_3H_6O+_h$, and $+C_4H_8O+_h$, *g* is an integer from 1 to 9 and *h* is an integer from 1 to 200;

said composition having a molecular weight in the range of 300 to 20,000 and a viscosity in the range from essentially 0 to 20 million centipoises at 70°C;

wherein R_1 is selected from the group consisting of hydrogen, phenyl, benzyl, alkyl, and cycloalkyl;

wherein said alkyl having from 1 to 9 carbon atoms, said cycloalkyl having from 3 to 8 carbon atoms.

3,872,153
PROCESS FOR THE PRODUCTION OF UNSATURATED ORGANIC COMPOUNDS

Donald Wright, and Samuel Gardner, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

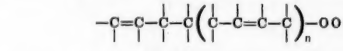
Filed Mar. 27, 1972, Ser. No. 238,611

Claims priority, application United Kingdom, Apr. 5, 1971,

Int. Cl. C07c *69/02, 69/34, 69/80*

U.S. Cl. 260—475 N **11 Claims**

1. A process for the production of unsaturated compounds containing one or more groups



in which *n* is 1, which consists essentially of reacting butadiene, isoprene or piperylene with an aromatic or alkanoic mono- or di- carboxylic acid in the presence of 10^{-7} to 1.0 molar concentration of a platinum or iridium compound and 10^{-5} to 10^{-2} molar concentration of a copper compound selected from copper nitrate, copper halide, copper naphthenate and copper alkanoate derived from a carboxylic acid containing up to 20 carbon atoms.

3,872,154
TRIMELLITATES

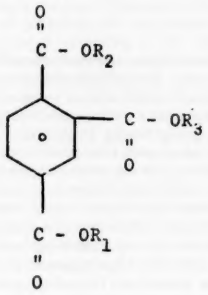
John William Hirzy, Saint Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 74,898, Sept. 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 481,928, Aug. 23, 1965, abandoned. This application Nov. 20, 1972, Ser. No. 308,220

Int. Cl. C07c *69/76*

U.S. Cl. 260—475 N **5 Claims**

1. A monoallyl trimellitate of the formula



, wherein one of R_2 and R_3 is allyl and the remaining R groups are like radicals selected from the group consisting of alkyl of 1 to 18 carbon atoms and cycloalkyl of 6 to 18 carbon atoms.

3,872,155
ESTERS OF BROMINATED DIPENTAERYTHRITOL

Steffen F. Dieckmann, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 47,897, June 19, 1970, abandoned. This application June 22, 1973, Ser. No. 372,577

Int. Cl. C07c *69/16, 69/62, 69/78, 69/88, 69/92*

U.S. Cl. 260—476 R **4 Claims**

1. An ester of brominated dipentaerythritol prepared by hydrobrominating dipentaerythritol in solution in an excess of an esterifying acid which is an unsubstituted or halosubstituted saturated aliphatic monocarboxylic acid containing 2 to 7 carbon atoms, benzoic acid, a substituted benzoic acid containing as substituents at least one halogen, lower alkyl, lower alkoxy or hydroxyl group, or a mixture of any of said acids at a temperature ranging from about 100° to about 140°C.

3,872,156
PROCESS FOR THE PREPARATION OF PHENOLS BY OXIDATION OF AROMATIC ALDEHYDES

Francois Bourdin, Lyon; Francois Chizat, Bron; Michel Costantini, Lyon, and Michel Jouffret, Francheville le Bas, all of France, assignors to Rhone-Poulenc S.A., Paris, France

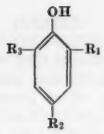
Filed Nov. 17, 1972, Ser. No. 307,530

Claims priority, application France, Nov. 19, 1971, 71.41411

Int. Cl. C07c *37/00*

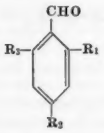
U.S. Cl. 260—479 R **8 Claims**

1. A process for the preparation of an oxidation product containing a major amount of a phenol of the general formula:



(I)

in which R_1, R_2 and R_3, which may be identical or different, each represent a hydrogen atom or a linear or branched alkyl radical containing 1 to 5 carbon atoms, or a formate ester of said phenol which comprises oxidising an aldehyde of the general formula:



(II)

in which R_1, R_2 and R_3, are as defined above, with hydrogen peroxide, the aldehyde being in solution in a solvent selected from the group consisting of tetramethylene-sulphone and C_1–C_4 alkyl substituted tetramethylene-sulphones.

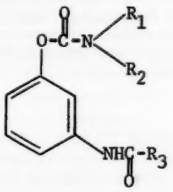
3,872,157

SUBSTITUTED ANILIDE CARBAMATES

Mervin E. Brokke, Richmond, and Eugene G. Teach, El Cerrito, both of Calif., assignors to Stauffer Chemical Company, New York, N.Y.

Filed Oct. 23, 1967, Ser. No. 677,050
Int. Cl. C07c *125/06*
U.S. Cl. 260—479 C **6 Claims**

1. A compound having the formula:



in which R_1 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, inclusive, and lower alkenyl having from 2 to 4 carbon atoms, inclusive; R_2 is selected from the group consisting of alkyl containing from 1 to 8 carbon atoms, inclusive, and lower alkenyl having 2 to 4 carbon atoms, inclusive; and R_3 is benzyl.

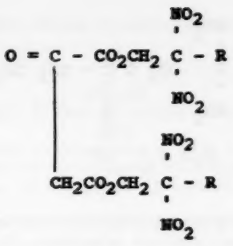
3,872,158

OXALACETIC ACID BIS(2-SUBSTITUTED-2,2-DINITROETHYL)ESTERS

Henry J. Marcus, West Covina, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

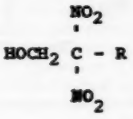
Filed Nov. 6, 1970, Ser. No. 97,438
Int. Cl. C07c *69/66*
U.S. Cl. 260—483 **4 Claims**

1. Oxalacetic acid ester of the formula



wherein R is selected from the group consisting of H, F, NO_2 and CH_3.

3. A method of preparing the compounds of claim **1** comprising contacting acetylenedicarboxylic acid and an alcohol of the formula



wherein R is selected from the group consisting of H, F, NO_2 and CH_3 at a temperature between about 5°C and 40°C in the presence of sulfuric acid.

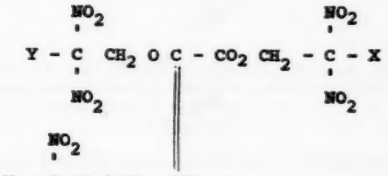
3,872,159

2-SUBSTITUTED-2,2-DINITROETHOXY-FUMARIC ACID BIS(2-SUBSTITUTED-2,2-DINITROETHYL)ESTER

Henry J. Marcus, West Covina, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 6, 1970, Ser. No. 97,439
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 P **4 Claims**

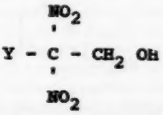
1. A fumaric acid ester of the formula



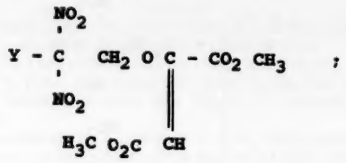
wherein X and Y vary independently and are selected from the group consisting of F, H, NO_2 and CH_3.

3. A method of preparing the compounds of claim **1** comprising;

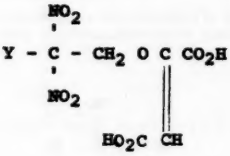
1. contacting in solution dimethyl acetylenedicarboxylic acid with an alcohol of the formula



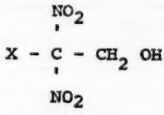
in the presence of pyridine at about 0°–5°C to produce



2. contacting in solution the product of step 1 with HCl to produce

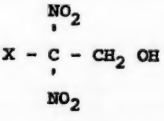


3. contacting in solution the product of step 2 with an alcohol of the formula



in the presence of polyphosphoric acid to yield the mono ester of the product of step 2;

4. contacting in solution the mono ester of step 3 with thionyl chloride in the presence of pyridine to obtain the mono ester - mono acid chloride, and
5. contacting said mono ester - mono acid chloride of step 4 with an alcohol of the formula



3,872,160

CIS 6-HYDROXY-HEXENOATE

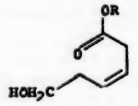
Robert T. Dahill, Jr., Perth Amboy, N.J., assignor to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 49,544, June 24, 1970, Pat. No. 3,836,513. This application June 15, 1973, Ser. No. 370,251

Int. Cl. C07c *69/66*

U.S. Cl. 260—484 R **3 Claims**

1. A cis 6-hydroxy-3-hexenoate of the formula



wherein R is lower alkyl or 1–6 carbons or cyclo alkyl of 4–8 carbon atoms.

3,872,161

PROCESS FOR THE MANUFACTURE OF ALKYLAMINOALKYL ACRYLATES

Shuzo Fukuchi; Noboru Shimizu, both of Osaka, and Takashi Ohara, Nishinomiya, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

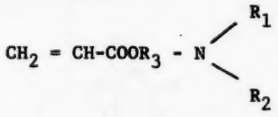
Filed Mar. 2, 1973, Ser. No. 337,421

Claims priority, application Japan, Mar. 6, 1972, 47-022239

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 R **30 Claims**

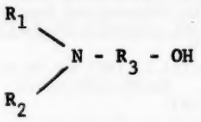
1. A process for the manufacture of alkyl aminoalkyl acrylates of the general formula:



wherein R_1 represents hydrogen atom or alkyl group containing 1 to 8 carbon atoms, R_2 represents alkyl group containing 1 to 8 carbon atoms, in case of R_1 being hydrogen atom, R_2 represents tert-alkyl group containing 4 to 8 carbon atoms and R_3 represents straight or branched alkylene group containing 2 to 4 carbon atoms comprising reacting an alkyl acrylate of the general formula:

$CE_2 = CH - COOR_4$

wherein R_4 represents alkyl group containing 1 to 4 carbon atoms with an alkyl aminoalkanol of the general formula:



wherein R_1, R_2 and R_3 have the same meanings as mentioned above, in the presence of a catalytic amount of a zinc compound selected from the group consisting of metallic zinc, zinc oxide, hydroxide and sulfide, inorganic and organic acid salts of zinc, alkyl zinc, zinc alkoxides, zinc chelate compounds, and zinc carbamates.

3,872,162

STABILIZED ETHYLENICALLY UNSATURATED BETA-YDROXY ESTERS PREPARED FROM A POLYEPOXIDE AND ACRYLIC OR METHACRYLIC ACID

Sol B. Radlove, Chicago; Abraham Ravve, Lincolnwood, and Kenneth H. Brown, Chicago, all of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed July 12, 1973, Ser. No. 378,759

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 B **8 Claims**

1. A method of preparing an ethylenically unsaturated beta-hydroxy ester stable to premature gelation comprising reacting at a temperature below 110°C a polyepoxide having at least 2 epoxide groups in the polyepoxide molecule with an ethylenically unsaturated carboxylic acid selected from the group consisting of acrylic and methacrylic acid in the presence of a small but effective amount of an divalent tin salt and an alkaline catalyst to prepare the beta-hydroxy ester and then recovering the ester.

3,872,163

METHOD OF PREPARING 1,4-DIACYLOXY-2-BUTENES

Tohru Shimizu; Teruo Yasui, and Sieshiro Nakamura, all of Kurashiki City, Japan, assignors to Kuraray Co., Ltd., Kurashiki City, Japan

Filed Jan. 19, 1972, Ser. No. 219,146

Int. Cl. C07c *67/04*

U.S. Cl. 260—491 4 Claims

1. A method for preparing 1,4-diacyloxy-2-butene which comprises reacting in the gaseous phase at a temperature of 100°–160°C. 1-acyloxy-1,3-butadiene with a carboxylic acid and oxygen in the presence of an effective amount of a catalyst consisting of metallic palladium.

3. A method for preparing 1,4-diacyloxy-2-butene wherein butadiene is reacted in the gaseous phase at a temperature of 100°–160°C. with a carboxylic acid and oxygen in the presence of an effective amount of a catalyst consisting of metallic palladium to obtain the product 1,4-diacetoxy-2-butene and 1-acyloxy-1,3-butadiene as a by-product, recycling the 1-acyloxy-1,3-butadiene and unreacted carboxylic acid to the reaction system wherein the 1-acyloxy-1,3-butadiene is simultaneously converted to 1,4-diacyloxy-2-butene.

3,872,164

PREPARATION OF GLYOCOL ACETATES

John P. Schmidt, Princeton, N.J., assignor to Halcon International, Inc., New York, N.Y.

Filed Dec. 12, 1973, Ser. No. 424,039

Int. Cl. C07c *67/04*, *69/16*

U.S. Cl. 260—497 R 14 Claims

1. In a process for producing glycol acetates by reacting acetic acid, ethylene and molecular oxygen in an oxidation zone in the presence of a catalyst system comprising a variable valent cation selected from at least one member of the group consisting of tellurium, cerium, antimony, manganese, vanadium, gallium, arsenic, cobalt, copper, chromium, and selenium and at least one of bromine, chlorine, a bromine-containing compound yielding bromide ions during reaction, or a chlorine-containing compound yielding chloride ions during reaction to produce a reaction mixture containing said product glycol acetates, said oxidation zone being supplied with a liquid feed comprising acetic acid, the improvement which comprises maintaining in said liquid feed a level of formic moieties of 3 to 10 weight percent.

3,872,165

MANUFACTURE OF VINYL SULFONATES AND VINYLSULFONIC ACID FROM CARBYL SULFATE

Walter Schenk, Bad Duerkheim; Roland Dahlinger, Neckargemuend, and Dieter Stockburger, Gruenstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Nov. 30, 1971, Ser. No. 203,453

Claims priority, application Germany, Nov. 30, 1970, 2058776

Int. Cl. C07c *143/16*

U.S. Cl. 260—513 R 3 Claims

1. In a process for the manufacture of a vinyl sulfonate by treating carbyl sulfate under alkaline conditions, the improvement comprises carrying out the process in two stages wherein a. said first stage is carried out by circulating a 20 to 28% aqueous caustic soda solution in a cooled closed loop, adding carbyl sulfate to the circulating solution until the pH reaches a value of 10 and then adding to the circulating solution on a continuous basis carbyl sulfate and sufficient 20 to 28% aqueous caustic soda solution such that the pH value is maintained between 10 and 12, the reaction solution being subjected to stirring and maintained at a temperature between 30° and 50°C, while continuously passing overflowing reaction solution into a separate reaction zone; and

b. said second stage is carried out by heating the reaction solution in said separate reaction zone to a temperature of from 70° to 150°C for a period of from 10 to 60 minutes and then cooling the solution for terminating the reaction.

3,872,166

IMPROVEMENT IN THE RECOVERY OF GLYOXYLIC ACID

Hermann Spaenig, 5 Eschkopfstrasse, 6703 Limburgerhof; Toni Dockner, 6 In der Grossgasse, 6701 Meckenheim, and Helmut Karn, 120 Sternstrasse, 6700 Ludwigshafen, all of Germany

Filed June 25, 1973, Ser. No. 373,011

Claims priority, application Germany, July 1, 1972, 2232352

Int. Cl. C07c *59/10*

U.S. Cl. 260—526 R 2 Claims

1. A process for the recovery of pure glyoxylic acid or sodium glyoxylate from the regeneration liquor obtained in the treatment of reaction mixtures from the production of glyoxal with a basic ion exchanger and elution of the ion exchanger wherein the ion exchanger containing glyoxylic acid is eluted with caustic soda solution, sodium carbonate solution or sodium bicarbonate solution, the eluate containing from 1 to 15 percent of glyoxylic acid is adjusted to a pH of from 3 to 6 and concentrated to such an extent, with or without cooling, that sodium glyoxylate is precipitated.

3,872,167

PRODUCTION OF O-SULFAMIDOBENZOIC ACIDS

Gerhard Hamprecht, Mannheim; Karl-Heinz Koenig, Frankenthal, and Gerhard Bolz, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

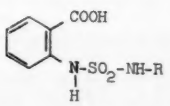
Filed Jan. 26, 1972, Ser. No. 221,021

Claims priority, application Germany, Feb. 2, 1971, 2104682

Int. Cl. C07c *143/80*

U.S. Cl. 260—518 R 8 Claims

1. A process for the production of an o-sulfamidobenzoic acid of the formula:



(I)

in which R is an aliphatic or cycloaliphatic radical, which process comprises reacting anthranilic acid or a salt of anthranilic acid with a sulfamyl halide of the formula:

$$X\text{-}SO_2\text{-}NH\text{-}R \quad \text{(II)}$$

in which R has the above meanings and X is halogen in the presence of a polar organic solvent at a temperature of from 15° to 40°C.

3,872,168

SYNTHESIS OF ACIDS AND AMIDES

James P. Collman, Stanford; Stanley R. Winter, Palo Alto, and Robert G. Komoto, East Palo Alto, all of Calif., assignors to The Board of Trustees of the Leland Stamford Junior University, Stamford, Calif.

Filed Oct. 2, 1972, Ser. No. 293,859

Int. Cl. C08h *17/36*

U.S. Cl. 260—539 R 13 Claims

1. A method of producing acids R_1COOH which comprises reacting a tetracarbonyl ferrate dianion with the substrate R_1X to produce an intermediate $R_1(CO)n\ Fe\ (CO)_4^-$, and reacting said intermediate with a cleaving agent and water, said cleaving agent being a halogenating agent or an oxygenating agent, to form said acids, wherein R_1 is selected from the group consisting of normal and branched chain alkyl, normal and

branched chain alkyl substituted by halide, hydroxyl, carboxy ester, ether or epoxy, an olefinic group, an aryl group and a cycloaliphatic group; X is selected from the group consisting of halide, tosylate, methane sulfonyl, trifluoromethane sulfonyl, phosphito, or phosphato; and *n* is zero or unity.

3,872,169

AMINO-OXIME ACETAMIDE-0-CARBAMATES AS ANTIHYPERTENSIVES

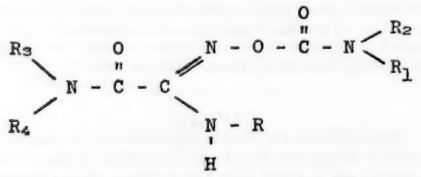
Russell F. Bellina, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 14, 1974, Ser. No. 442,406

Int. Cl. C07c *103/28*

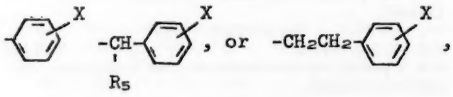
U.S. Cl. 260—558 A **6 Claims**

1. A compound of the formula



wherein

R is



where

X is H, Br, Cl, F, or CF_3, and R_5 is H, CH_3, C_2H_5, n-C_3H_7, or iso-C_3H_7;

R_1 and R_2 are the same or different and are hydrogen, methyl, ethyl, normal propyl, isopropyl, cyclopropyl, or allyl, with the proviso that the sum of the carbon atoms in R_1 and R_2 does not exceed 4; and

R_3 and R_4 are the same or different and are C_1-C_3 alkyl.

3,872,170

CONTINUOUS MANUFACTURE OF AN AQUEOUS CHOLINE CHLORIDE SOLUTION

Horst Bosche, and Uwe Soenksen, both of Ludwigshafen, Germany, assignors to Badische Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Mar. 23, 1972, Ser. No. 237,321

Claims priority, application Germany, Mar. 29, 1971, 2115094

Int. Cl. C07c *91/06*

U.S. Cl. 260—567.6 M **7 Claims**

1. In a continuous process for the manufacture of choline chloride by reacting excess ethylene oxide with trimethylammonium chloride in aqueous solution at a temperature of from 30° to 100°C in a closed stirred vessel in which a gas space is present above the level of the liquid reaction mixture, the improvement comprising operating at substantially atmospheric pressure and continuously bathing the surfaces defining the gas space in the stirred vessel with the reaction mixture or with fresh trimethylammonium chloride solution.

3,872,171

POLYAMINES AS ANTIVIRAL AGENTS IN ANIMALS

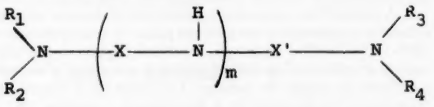
Timothy H. Cronin, Niantic; Hermann Faubl, Groton; William W. Hoffman, Mystic, and James J. Korst, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 146,548, May 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 62,192, Aug. 7, 1970, abandoned. This application Feb. 6, 1973, Ser. No. 330,042

Int. Cl. C07c *91/12*

U.S. Cl. 260—584 R **6 Claims**

1. A compound of the formula



and the non-toxic acid addition salts therof wherein

R_1 is alkyl of from 1 to 20 carbon atoms;

R_2 is alkyl of from 12 to 20 carbon atoms;

R_3 and R_4 are each hydroxyalkyl of from 2 to 8 carbon atoms;

X and X' are each straight chain alkylene of from 2 to 6 carbon atoms; and

m is 0 or 1.

3,872,172

PROCESS FOR PREPARATION OF TERPENE FLAVORANTS AND NOVEL INTERMEDIATES THEREFOR

Erhard Bertele, Dubendorf, and Peter Schudel, Grut near Wetzikon, both of Switzerland, assignors to Givaudan Corporation, Delawanna, N.J.

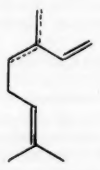
Filed July 3, 1968, Ser. No. 742,178

Claims priority, application Switzerland, July 7, 1967, 9749/67; Nov. 1, 1967, 15391/67

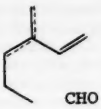
Int. Cl. C07c *47/20*

U.S. Cl. 260—601 R **3 Claims**

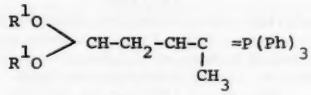
1. The process which comprises ozonizing a solution of a product having the formula:



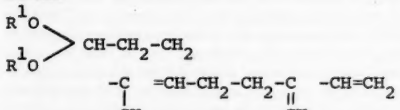
at temperatures below ambient room temperature with not more than an equimolecular equivalent of ozone decomposing the resulting ozonized product, in the presence of a reducing agent suitable for reducing ozonization products to aldehydes, selected from the group consisting of an iodide, a sulphite, a bisulphite, formaldehyde, sulphur dioxide, pyridine, hydrazine hydrate, a sulphide, hydroquinone, zinc or magnesium in acidic solution, Raney-nickel, phosphorus (III)-compounds, tri-lower alkyl-phosphites and hydrogen, to form the product having the formula:



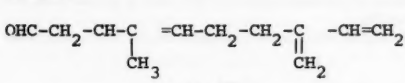
reacting said aldehyde with a phosphorane of the general formula:



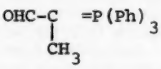
wherein Ph signifies a phenyl group and the symbols R^1 signify lower alkyl groups which may also be linked with each other to form a lower alkylene group, in accordance with a Wittig reaction, to give a mixture of triene acetals of the general formula:



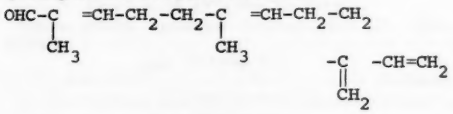
wherein R^1 has the same meaning as above, hydrolyzing, the triene acetal which is obtained to the triene aldehyde of the formula:



and reacting this triene aldehyde with a phosphorane of the general formula:



wherein Ph has the above significance, to give the corresponding tetraene aldehyde of the formula:



3,872,173

PROCESS OF MANUFACTURING PARA-TERT-BUTYL-PHENOL

Jean Berthoux, Decines, and Ghislain Schwachhofer, Miribel, both of France, assignors to Progil, Paris, France

Filed July 6, 1970, Ser. No. 52,732

Claims priority, application France, July 11, 1969, 69.23923

Int. Cl. C07c *39/06*

U.S. Cl. 260—624 E **10 Claims**

1. In a process of manufacturing para-tertbutylphenol from phenol and isobutene which comprises reacting said isobutene with liquid phenol mixed with an acid-activated clay, the improvement comprising

providing said isobutene in the form of a gaseous mixture with normal butenes, and wherein the reaction mixture contains a quantity of moisture representing 0.5 to 5 percent by weight of water with respect to phenol,

the reaction being carried out in two stages comprising

(1) maintaining the liquid mixture at a temperature not exceeding 55° C. in the presence of said acid-activated clay and said water and during feeding of said gaseous mixture and

(2) then, stopping the introduction of said gaseous mixture at a point such that after the olefin introduction step the molar ratio of free or combined phenol in the reaction mass to fixed isobutene is not lower than 1.5; and submitting the reaction mixture without intermediate treatment to a temperature of about 110°C. to about 120°C. while dehydrating it by azeotropic distillation.

3,872,174

PRODUCTION OF DICHLOROETHYLENE USING MELT CHLORINATION PROCESS

Harold Edward Bellis, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 740,672, June 27, 1968, abandoned. This application May 6, 1971, Ser. No. 141,013

Int. Cl. C07c *21/04*

U.S. Cl. 260—654 R **3 Claims**

1. A chlorination process consisting essentially of chlorinating a material selected from the group consisting of ethylene, ethylene dichloride, vinyl chloride and mixtures thereof to produce a chlorinated product which contains at least 50 mole percent of dichloroethylene, in a reaction zone, which is essentially free of elemental chlorine at a temperature within the range of from 200°–450°C., by means of a melt comprising iron chloride and alkali meltal chloride by dispersing the material to be chlorinated in the melt, the melt being the continuous phase, whereby said material is chlorinated by the melt; withdrawing a gaseous effluent from the reaction zone which contains unreacted starting material and the resulting chlorinated hydrocarbon products and recovering the chlorinated hydrocarbon products from the effluent as the products of the process; wherein:

a. the alkali metal chloride is selected from the group consisting of sodium chloride, potassium chloride, a mixture thereof, a mixture of sodium chloride and no more than 20 mole peprcent lithium chloride, a mixture of potassium chloride and no more than 20 mole percent lithium chloride, and a mixture of sodium chloride, potassium chloride and no more than 20 mole percent lithium chloride;

b. the mole ratio of alkali metal chloride to iron chloride is from about 0.5:1 to about 2:1; and

c. 60–90 mole percent of the iron chloride is maintained as ferric chloride.

3,872,175

CATALYTIC PROCESS FOR PREPARING ALKYL CHLORIDES

Stephen Robota, N. Tonawanda, and Francis P. Mershon, White Plains, both of N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N,Y.

Filed Aug. 31, 1973, Ser. No. 393,550

Int. Cl. C07c *17/16*

U.S. Cl. 260—657 **2 Claims**

1. A process for the production of alkyl chlorides of from 1 to 4 carbon atoms by the vapor phase reaction of hydrogen chloride with the corresponding alkanol at a temperature between about 250° and about 400°C in the presence of a calcined attapulgus clay catalyst.

3,872,176

PREPARATION OF 1,1,1-TRICHLOROETHANE

Gerald L. Kochanny, Jr., and Thomas A. Chamberlin, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 799,484, Feb. 14, 1969, abandoned. This application Aug. 17, 1972, Ser. No. 281,475

Int. Cl. C07c *17/10*

U.S. Cl. 260—658 R 9 Claims

1. A process for making 1,1,1-trichloroethane comprising reacting by contacting in liquid phase (a) Cl_2O with (b) chloroethane, 1,1-dichloroethane or a mixture thereof; said process being conducted neat or in an inert solvent selected from the group consisting of liquid perhalogenated hydrocarbons and 1,1,1-trichloroethane at a reaction temperature of from about −20° to about 80°C under substantially anhydrous conditions in the substantial absence of actinic light.

3,872,177

POLYMERIZATION CATALYST

Adel F. Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 139,804, May 3, 1971, Pat. No. 3,767,632, which is a continuation-in-part of Ser. No. 761,831, Sept. 23, 1968, abandoned. This application June 21, 1973, Ser. No. 372,360

Int. Cl. C07f *1/02*

U.S. Cl. 260—665 R 3 Claims

1. A complex of (1) one mole of a hydrocarbon lithium which is a polymerization catalyst and (2) 0.1 to 20 moles of potassium hydroxide.

3,872,178

CATALYST AND PROCESS FOR DOUBLE-BOND ISOMERIZATION

Donald C. Tabler, Bartlesville, Okla., assignor to Phillips Petroleum, Bartlesville, Okla.

Division of Ser. No. 78,209, Oct. 5, 1970, Pat. No. 3,770,660. This application Mar. 22, 1973, Ser. No. 344,046

Int. Cl. C07c *5/24*

U.S. Cl. 260—666 25 Claims

1. A process for the double bond isomerization of double bond isomerizable olefinic hydrocarbons which comprises contacting said olefinic hydrocarbon under double bond isomerization conditions in admixture with molecular hydrogen with a catalyst composition consisting essentially of uranium, a Group VA element selected from the group consisting of phosphorus, arsenic, antimony, and bismuth, oxygen in combined form with said uranium or Group VA element, and a solid high surface area catalyst support, wherein the ratios of uranium: Group VA element are effective for said double bond isomerization, and said catalyst composition is pretreated at elevated temperatures with molecular hydrogen prior to said contacting.

3,872,179

PROCESS FOR CATALYTIC STEAM CRACKING

Kjeld Jorn Andersen, Tulstrup; Finn Fischer, Holte; Jens Rostrup-Nielsen, Virum, and Johannes Wrisberg, Holte, all of Denmark, assignors to Haldor Topsoe A/S, Soberg, Denmark and Fluor Corporation, Los Angeles, Calif.

Filed July 25, 1973, Ser. No. 382,429

Claims priority, application United Kingdom, Aug. 14, 1972, 37858/72

Int. Cl. C07c *3/34*

U.S. Cl. 260—683 R 6 Claims

1. An improved cracking process for the manufacture of unsaturated hydrocarbons comprising a gaseous catalytic reaction step of contacting a preheated vaporized hydrocarbon feedstock consisting of predominantly saturated hydrocarbons at a temperature below 1,100°C and at a pressure in the range from 1 to 30 atm. abs. in the presence of steam added in a proportion of from 0.1 to 10 parts per part of hydrocarbon feedstock with a catalyst consisting of zirconia together with 0.1–10 wt.% of an alkali metal compound calculated as the oxide and less than 2 wt.% of other metal compounds calculated as the metal, wherein the improvement comprises a step of adding, at least during periods of operation of the process, to the preheated vaporized hydrocarbon feedstock an alkali metal compound in an average proportion of from 0.1 to 500 mg of alkali metal per kg of hydrocarbon feedstock.

3,872,180

METHOD FOR PRODUCING ISOPENTENE

Shunsuke Nakatomi, Chiba; Yasuhiko Kohtoku, and Tosihiro Inoue, both of Ichihara, all of Japan, assignors to UBE Industries, Ltd., Ube-shi, Yamaguchi-ken, Japan

Filed June 6, 1974, Ser. No. 476,938

Claims priority, application Japan, June 22, 1973, 48-69802

Int. Cl. C07c *3/62*

U.S. Cl. 260—683 D 22 Claims

1. A method for producing isopentene comprising the steps of:

bringing a hydrocarbon mixture containing isobutene and n-butene into contact, at a temperature of 220°C to 380°C, with a catalyst which has been prepared by depositing a molybdenum compound and at least one additional metal compound selected from the group consisting of cobalt, tin, silver, zinc, cadmium, lead, bismuth and antimony compounds on an alumina carrier and calcining the compounds deposited, thereon the contact being carried out in the presence of steam in an amount of 0.1 to 25% based on the volume of said hydrocarbon mixture and calculated in terms of volume under standard conditions of a temperature of 0°C and a pressure of 760 mmHg;

isolating the resultant isopentene from the reaction mixture.

3,872,181

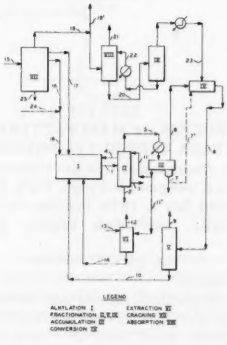
PRODUCTION OF ETHYL FLUORIDE FOR HF ALKYLATION

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 14, 1972, Ser. No. 288,937

Int. Cl. C07c *3/54*

U.S. Cl. 260—683.49 6 Claims



1. A combination alkylation-cracking process which comprises the steps of:

a. subjecting a hyrocarbon feedstream to cracking to produce separate product streams comprising an olefin feedstock including butylenes, an isobutane stream, and an ethylene-containing light gas stream,
b. passing said streams comprising said olefin feedstock and isobutane as at least a part of the feed to an HF alkylation zone to produce an alkylation reaction effluent comprising C_5 and heavy alkylate products, unreacted isobutane, butane, propane, ethane, lighter hydrocarbon components, and HF,
c. separating said HF from said alkylation reaction effluent to form an alkylation effluent product stream,
d. separating said alkylation effluent product stream into an overhead stream comprising said propane, said ethane, said lighter hydrocarbon components and HF content remaining in said stream, a bottoms stream comprising said C_5 and said heavier alkylate products, and intermediate streams comprising said butane and said unreacted isobutane,
e. passing said overhead stream to a conversion zone and therein contacting said stream with said ethylene-containing light gas stream produced in said cracking step (a) to convert said HF content in said overhead stream into ethyl fluoride, and
f. withdrawing from said conversion zone a stream comprising HF-free ethyl fluoride, propane, ethane, and lighter hydrocarbons and passing said stream to a separation zone wherein the ethane and lighter hydrocarbons are recovered overhead, and propane and ethyl fluoride are recovered as bottoms therefrom.

3,872,182

THERMOPLASTIC MOULDING COMPOSITION ON THE BASIS OF POLYOXYMETHYLENE

Gunter Sextro, Naurod; Karlheinz Burg, Langenhain/Taunus, Rudolf Kern, Mainz; Heinz Schmidt, and Ernst Wolters, both of Frankfurt/Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Filed Feb. 16, 1973, Ser. No. 332,810

Claims priority, application Germany, Feb. 22, 1972, 2208168

Int. Cl. C08g *37/04*

U.S. Cl. 260—830 R **8 Claims**

1. A thermoplastic molding composition based on polymers predominantly comprising oxymethylene units and essentially consisting of a mixture of

a. 99.999 to 80 wt. % of a linear poly(oxymethylene) or a copolymer containing oxymethylene units and 0.1 to 20 wt. % of oxyalkylene groups, based on the weight of said copolymer, with 2 to 8 adjacent carbon atoms, and
b. 0.001 to 20 wt. % of a graft copolymer consisting of
   1. 0.1 to 30 wt. %, based on the weight of said graft copolymer, of a primary polymer with a main chain consisting of aliphatically or aromatically bound carbon atoms which may be interrupted by ether oxygen atoms, the primary polymer having a number average molecular weight of at least 400 and
   2. 99.9 to 70 wt. %, based on the weight of said graft copolymer, of side chains grafted on said primary polymer, said side chains consisting of oxymethylene groups which may be interrupted by 0.1 to 20 wt. % based on the weight of said side chains, of statistically distributed oxyalkylene groups with 2 to 8 adjacent carbon atoms.

3,872,183

COPOLYESTER RESIN CONTAINING ANION ATTRACTIVE GROUPS

Max H. Keck, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 2, 1973, Ser. No. 375,573

Int. Cl. C08g *39/10*

U.S. Cl. 260—860 **30 Claims**

1. A thermoplastic polymeric fiber forming polyester resin having the capability of being dyed by anionic dyes which comprises a fiber forming polyester resin derived from dicarboxylic acids or ester forming derivatives thereof and glycols and containing as a part of the polymeric polyester molecules an anion attractive group that has associative properties sufficiently strong that interaction occurs between anion attractive groups of the polymer molecules, said anion attractive group is derived from compounds selected from the group consisting of monohydroxyamine salts of oxalic acid and dihydroxyamine salts of organic dicarboxylic acids in which the carboxyl groups are separated by at least two carbon atoms and, said amine salts are used in amounts to provide from about 1 to about 15 mol percent of amine units based on the total mols of acid units in the polyester exclusive of the acid units in the amine salt.

3,872,184

O-ALKYL-S-ALKYL-S-[1,2-BIS(ALKOXYALKOXY, BENZLOXY(ALKYLAMINO)CARBONYL ETHYL] DITHIOPHOSPHATES

Ernst Beriger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

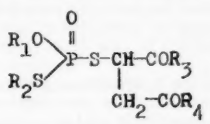
Filed Apr. 25, 1973, Ser. No. 354,405

Claims priority, application Switzerland, Apr. 27, 1972, 6265/72

Int. Cl. C07f *9/16;* **A01n** *9/36*

U.S. Cl. 260—942 **7 Claims**

1. Thiol phosphoric acid esters of the formula



wherein R_1 represents methyl or ethyl, R_2 represents n-propyl, n-butyl, i-butyl, sec.butyl, n-pentyl, sec.pentyl, or methoxyethyl, R_3 and R_4 each represents methoxyethoxy, ethoxyethoxy, ethoxyethoxyethoxy, benzyloxy, or the group

in which R_5 and R_6 each represents hydrogen, methyl, or allyl.

3,872,185

O-(N-ALKOXY-BENZIMIDOYL)-(THIONO)-PHOSPHORIC (PHOSPHONIC) ACID ESTERS

Walter Lorenz, Wuppertal; Ingeborg Hammann; Wolfgang Behrenz, both of Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

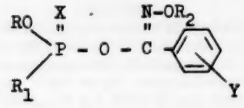
Filed Mar. 26, 1973, Ser. No. 344,798. The portion of this patent subsequent to Sept. 18, 1990 has been disclaimed

Claims priority, application Germany, Apr. 6, 1972, 2216551

Int. Cl. C07f *9/08, 9/40;* **A01n** *9/36*

U.S. Cl. 260—944 **7 Claims**

1. An O-(N-alkoxy-benzimidoyl)-(thiono)-phosphoric (phosphonic) acid ester of the formula



(I)

in which

R and R_2 each independently is alkyl of 1 to 6 carbon atoms,

R_1 is alkyl or alkoxy of 1 to 6 carbon atoms,

X is oxygen or sulfur, and

Y is lower alkoxy or alkylmercapto.

3,872,186

3-ACETYL-4-HYDROXYBENZYL PHOSPHONATES

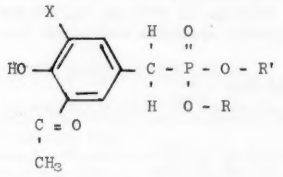
Joseph G. E. Fenyes, and Kenneth J. Flanagan, both of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Continuation of Ser. No. 168,744, Aug. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 127,776, March 24, 1971, Pat. No. 3,767,735. This application Oct. 3, 1973, Ser. No. 399,022

Int. Cl. C07f *9/40;* **C08f** *45/58*

U.S. Cl. 260—946 **3 Claims**

1. A compound having the formula:



wherein R and R′ are straight or branched chain unsubstituted or substituted wherein R and R′ are straight or branched chain unsubstituted or substituted alkyl groups containing 1 to 18 carbon atoms wherein the substituent group is a halogen, and X is bromine or hydrogen with the provision that when X is hydrogen, R and R′ are substituted.

3,872,187

ARYLOXYALKYL HALOALKYL PHOSPHATES

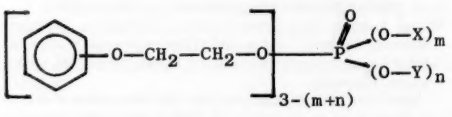
Joseph Fath, Princeton, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 290,058, Sept. 18, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,076

Int. Cl. C07f *9/08*

U.S. Cl. 260—951 **6 Claims**

1. A phosphate ester that has the structural formula



wherein X and Y each represents haloalkyl having 2 to 4 carbon atoms and at least 2 halogen atoms selected from the group consisting of bromine, chlorine, and mixtures thereof; and

m and *n* each represents a number in the range of 0 to 2, the sum of *m* and *n* being 1 or 2.

3,872,188

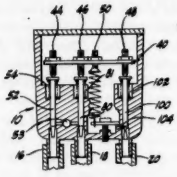
APPARATUS FOR CONTROLLING AND MODULATING ENGINE FUNCTIONS

Morris C. Brown, Florissant; Forrest W. Cook, Webster Groves, both of Mo.; Kalert, Ralph E., Granite City, Ill.; Arthur C. Vollmer, St. Charles, and Jerry H. Winkley, St. Louis, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Feb. 9, 1973, Ser. No. 331,198

Int. Cl. F02m *1/10*

U.S. Cl. 261—39 A **4 Claims**



1. In an internal combustion engine having a plurality of engine functions operable by the suction created by the natural aspiration of said engine during running condition, the improvement comprising;

an attachment connected to said engine communicating on one side with ambient air and on another side with at least one suction controlled passage leading to at least one engine function controlling means,

said attachment including a bellows responsive to barometric and/or temperature changes of said atmospheric air to change a dimension of said bellows,

said bellows being mounted in a housing, said housing also including a pivotable plate surmounting said bellows,

at least one metering means being connected to said plate, said metering means being adapted to meter ambient air to said at least one engine function controlling means,

said pivotable plate being pivoted at one end thereof,

said plate adjustable contacting said bellows at an intermediate position along the length of said plate,

said plate also having adjustable biasing means at the end opposite said pivoted end, and

said biasing means constituting an adjustable spring adjustably secured to said plate at a first end thereof and also adjustably secured to said housing.

3,872,189

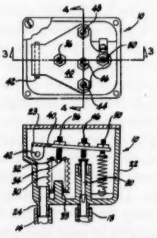
APPARATUS FOR CONTROLLING AND MODULATING ENGINE FUNCTIONS

Morris C. Brown; Forrest W. Cook; Ralph E. Kalert; Arthur C. Vollmer, and Jerry H. Winkley, all of St. Louis, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Feb. 9, 1973, Ser. No. 331,219

Int. Cl. F02m *1/10*

U.S. Cl. 261—39 A **5 Claims**



1. In an internal combustion engine having a plurality of engine functions operable by the suction created by the natu-

ral aspiration of said engine during running condition, the improvement comprising;

an attachment connected to said engine communicating on one side with ambient air and on another side with at least one suction controlled passage leading to at least one engine function controlling means,

said attachment including a bellows responsive to barometric and/or temperature changes of said atmospheric air to change a dimension of said bellows,

said bellows being mounted in a housing, said housing also including a pivotable plate surmounting said bellows,

at least one metering means being connected to said plate, said metering means being adapted to meter ambient air to said at least one engine function controlling means and said metering means including an adjustment means for setting said metering means to a preselected value of metered air when said attachment is subjected to a preselected set of ambient air conditions of altitude and/or temperature.

3,872,190

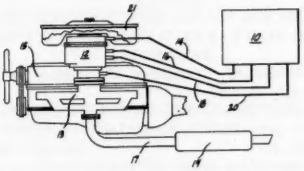
APPARATUS FOR CONTROLLING AND MODULATING ENGINE FUNCTIONS

Morris C. Brown, Florissant; Forrest W. Cook, Webster Groves, both of Mo.; Ralph E. Kalert, Granite City, Ill.; Arthur C. Vollmer, St. Charles, and Jerry H. Winkley, St. Louis, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Feb. 9, 1973, Ser. No. 331,286

Int. Cl. F02m *1/10*

U.S. Cl. 261—39 A **4 Claims**



1. In an internal combustion engine having a plurality of engine functions operable by the suction created by the natural aspiration of said engine during running condition, the improvement comprising;

an attachment connected to said engine communicating on one side with ambient air and on another side with at least one suction controlled passage leading to at least one engine function controlling means,

said attachment including control means responsive to barometric and/or temperature changes to change a dimension of said control means,

said control means being connected to a metering means adapted to admit said ambient air to said suction controlled passage in accordance with changes in said dimension, and

the said suction controlled passage terminating at an end thereof in the vacuum chamber of a vacuum motor.

3,872,191

FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Jake J. Walcker, 286 Merrywood Cir., Loma, Calif. 91752

Filed Nov. 8, 1973, Ser. No. 413,955

Int. Cl. F02m *15/02*

U.S. Cl. 261—145 **4 Claims**

1. In a fuel system for an internal combustion engine having an intake manifold, a source of liquid hydrocarbon fuel, a source of heated fluid, and a throttle linkage, the combination of:

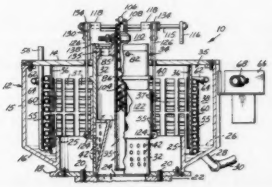
a generally circular housing mounted on the end of said intake manifold and having an inlet opening through one wall thereof;

a cylindrical conduit disposed vertically within said housing at the center thereof, the bottom end of said conduit being attached to the bottom of the housing and communicating with the interior of said intake manifold;

a length of heat-exchange tubing wound into a vertically disposed cylindrical coil surrounding said conduit, the individual turns of the coil being closely spaced apart with respect to one another;

the ends of said heat exchange tubing being connected to said source of heated fluid, whereby the heated fluid is circulated continuously through the tubing;

a wire mesh screen wrapped around said coil of heat exchange tubing in close, heat-exchange contact therewith,



whereby the screen becomes hot by conduction of heat from the tubing;

means for flowing liquid hydrocarbon fuel down over said wire mesh screen from the top edge thereof;

the liquid fuel flowing down over said hot wire mesh screen and the coils of heated tubing being vaporized, and the fuel vapor being mixed with air flowing radially inward through the screen;

means for admitting the mixture of vaporized fuel and air into said conduit;

means connected to said throttle linkage for controlling the volume of vaporized fuel and air mixture into said intake manifold; and

means for introducing a controlled amount of additional fresh air into said fuel-and-air mixture as the latter flows downwardly through said conduit into said intake manifold.

3,872,192

WET PROCESS FOR COMPOUNDING POLYMER-SOLIDS COMPOSITIONS

Martin H. Kaufman, and Edward M. Roy, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 7, 1970, Ser. No. 69,512

Int. Cl. C06b *21/02*

U.S. Cl. 264—3 B **5 Claims**

1. A process for compounding polymer-solids compositions which comprises the steps of:

a. forming a solution by dissolving a polymer which is soluble in a volatile solvent which will dissolve the polymer;

b. forming a paste by adding solid particles selected from the group consisting of solid oxidizer particles, solid metal particles, solid high explosive particles, solid fluorocarbon particles and mixtures thereof to said solution;

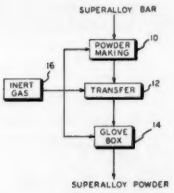
c. extruding said paste through a die having a diameter at least as large as the maximum diameter of said solid particles; and

d. passing the extruded paste through a current of warm air.

3,872,193
PROCESS FOR PRODUCING POWDERED SUPERALLOYS

James Thomas Smith, Towanda, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 24, 1971, Ser. No. 146,142
Int. Cl. B01j 2/04
U.S. Cl. 264—8 5 Claims

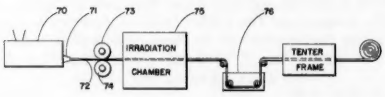


1. A process suitable for producing prealloyed superalloy powders, said process comprising conducting in an inert atmosphere containing less than about 1 part per million of oxygen, water and nitrogen the following processing steps:
   a. placing a shaped article of a superalloy having a preselected metallurgical content in an induction furnace,
   b. induction melting a portion of said article at a controlled rate by induction heating,
   c. forming droplets of molten metal by subjecting the molten metal to a centrifugal force by a rotating disc,
   d. cooling said droplets to form solid particles of superalloy, and
   e. collecting said particles.

3,872,194
PROCESS FOR PRODUCING A BULK CUSHIONING MATERIAL

Robert D. Lowry, and John W. Harrison, both of Winchester, Mass., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Sept. 30, 1970, Ser. No. 76,723
Int. Cl. B29d 7/02, 7/24
U.S. Cl. 264—22 5 Claims

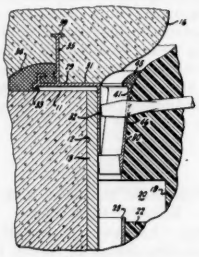


1. A process for producing a bulk cushioning material comprising the steps of:
   a. producing a regular, repeating bulking pattern in a plastic sheet with a memory;
   b. heating said plastic sheet;
   c. stretching said sheet while it is heated until it is flattened thereby removing the bulking effect of said pattern;
   d. cooling said sheet; and, thereafter,
   e. heating said sheet to restore the pattern which had been formed therein.

3,872,195
METHOD OF MOLDING CONCRETE COPING

William J. Stegmeier, 1073 Shary Cir., Concord, Calif. 94520

Division of Ser. No. 154,865, June 21, 1971, Pat. No. 3,708,930, which is a division of Ser. No. 819,173, April 25, 1969, Pat. No. 3,605,357, which is a continuation-in-part of Ser. No. 761,726, Sept. 23, 1968,. This application Oct. 20, 1972, Ser. No. 299,318
Int. Cl. E04b 1/16
U.S. Cl. 264—35 11 Claims



5. The method of claim 1 wherein said step of securing said tearable strip component to said form section comprises the step of applying an elastomeric mastic to said seal structure in overlapping relationship with said tearable strip component and said form section.

3,872,196
PROCESS FOR PLASTICIZING AND PARTIALLY DRYING TUBULAR FILM CASINGS FOR EDIBLE PRODUCTS

Douglas J. Bridgeford, Champaign, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Dec. 4, 1972, Ser. No. 311,985
Int. Cl. B29c 25/00
U.S. Cl. 264—37 7 Claims

1. In a process for producing tubular food casings of a hydrophilic polymeric film in which the tubular film is continuously formed in a gel state and dried the improvement for simultaneously drying and plasticizing said casing which comprises passing gel tubular film containing about 40–90% water continuously through a hygroscopic liquid consisting essentially of a hygroscopic and plasticizing agent for said gel film or an aqueous solution of a hygroscopic and plasticizing agent containing up to about 75% water at a rate sufficient to remove about 25–70% of the water therefrom without reaching equilibrium distribution of water and plasticizing agent between said gel film and said liquid and without allowing the plasticizing agent in said film to exceed about 30%.

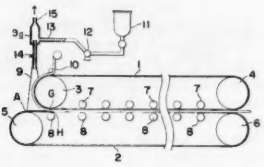
3,872,197
PROCESS AND AN APPARATUS FOR CONTINUOUSLY CASTING A SHEET AND THE LIKE

Tetsuji Kato; Katsumi Tamai; Isao Kamada; Hiroshi Kichiji; Yoshio Nakai; Haruyoshi Kitahara; Yasuhiko Iwaoka; Kiyonori Okajima, and Tadaomi Ueno, all of Otake, Japan, assignors to Mitsubishi Rayon Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 889,178, Dec. 30, 1969, abandoned. This application Oct. 30, 1972, Ser. No. 301,716
Claims priority, application Japan, Dec. 30, 1968, 43-96655; Apr. 17, 1969, 44-29359
Int. Cl. B29d 7/14
U.S. Cl. 264—40 18 Claims

1. A method for continuously casting a liquid having a viscosity rendering it flowable under the force of gravity and which hardens with changing temperature and time, in a traveling casting space having casting and discharging ends, said

space being defined between two opposed, vertically interspaced, externally restrained, horizontal upper and lower, elongated, flexible belt spans having side seals and traveling at the same speed and in the same direction and formed by endless flexible belts each running around horizontally interspaced cylindrical rolls forming each belt into a loop having semi-cylindrical ends; wherein the improvement comprises continuously casting said liquid into said casting end by flowing the liquid into contact with said belts while controlling the traveling speed of said belts so that by the belts' engagement



with the liquid the latter receives therefrom a forwardly directed force, said liquid hardening as it travels through said space and the latter being long enough to permit said hardening, said force being greater than the force of gravity on the liquid to a degree preventing the latter force from causing said liquid to flow reversely out of said casting end far enough to fall from said lower belt, and the total of said forces producing a pressure on the liquid cast in said casting space, prior to the liquid hardening therein, which is at least sufficient to hydraulically support said upper span

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3,872,198

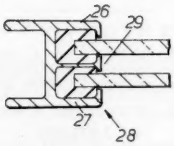
METHOD OF MAKING MULTIPLE-GLAZED UNITS

John C. Britton, Fritton Lodge, 103 Gayton Rd., King's Lynn, Norfolk, England

Filed Jan. 8, 1973, Ser. No. 321,674

Int. Cl. C03c *27/00;* **B29d** *27/00*

U.S. Cl. 264—46.6 **3 Claims**



1. A method of forming a multiple-glazed door or window unit, comprising

inserting at least two sheets of glazing material in parallel channels in a frame, each of said channels having a bottom and side walls, said side walls having flange portions which project inwardly of said channels and so closely approaching opposite surfaces of the respective sheet of glazing material as to provide only a small clearance adjacent said surfaces; and

injecting a foam plastics material into the space between the bottom and side walls of each channel and the respective sheet of glazing material to form a substantially rigid foam plastics material insert, while utilizing said flange portions to retain the injected material within said channels.

3,872,199

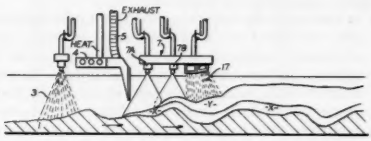
METHOD OF MANUFACTURING A FOAMED URETHANE STRUCTURAL PRODUCT HAVING HIGH AND LOW DENSITY PORTIONS

Lester V. Ottinger, Danbury, assignor to Champion International, Corporation, New York, N.Y.

Filed June 16, 1971, Ser. No. 153,604

Int. Cl. B29d *27/04*

U.S. Cl. 264—46.4 **13 Claims**



1. Process for manufacturing a high quality molded urethane structural product which comprises introducing a relatively high density foamable urethane mixture into a moving mold from a first spray applicator, subsequently continuously introducing additional relatively low density foamable urethane mixture into said mold from a second spray applicator in a manner that the spray from said second applicator slightly overlaps the spray from said first applicator, and in a manner that the foamable urethane mixture from said second applicator completely covers the foamable urethane mixture from said first applicator in said mold.

3,872,200

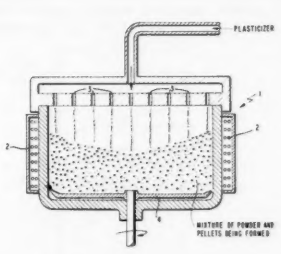
METHOD OF PRODUCING FOAMABLE PELLETS

Takao Tokito, and Yasushige Kawamoto, both of Fukuyama, Japan, assignors to Hiroshima Kasei, Ltd., Fukuyama-shi, Hiroshima-ken, Japan

Filed July 3, 1972, Ser. No. 268,559

Int. Cl. B29c *23/00;* **B29d** *27/00;* **C08j** *1/18*

U.S. Cl. 264—54 **4 Claims**



1. A method for producing foamable pellets having diameters ranging from 0.2 to 4.0mm comprising the step of agitating a powdered mixture ccmprising thermoplastic synthetic resin selected from the group consisting of polyvinyl chloride and polyvinyl chloride copolymer, stabilizers, fillers, pigments and blowing agents at the temperature within the range of 20° -60°C in a tank provided with nozzles and a stirrer in which the stirrer is rotating at a rotational speed within the range of 100 – 400 R.P.M. while slowly dropping through said nozzles a plasticizer for said thermoplastic resin in liquid form on to said powdered mixture, whereby said pellets are formed in said tank.

3,872,201

METHOD OF CURING FOAM INFLATED TIRES

David H. Paul, Akron, and Joseph A. Rosey, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 42,581, June 1, 1970,. This application Sept. 19, 1973, Ser. No. 398,617

Int. Cl. B29d *27/00*; B60c *7/00*

U.S. Cl. 264—55 6 Claims

1. A method of inflating tires with foamable elastomeric material comprising the steps of:

a. at least partially filling the cavity of a previously molded and vulcanized tire with unfoamed, uncured, foamable elastomeric material selected from a group of natural rubber, polyisoprene, ethylene-propylene terpolymer, polybutadiene, silicone polymer, styrene-butadiene, neoprene, acrylonitrile, and chlorosulfonated polyethylene;

b. mounting the tire with the material on a wheel rim;

c. placing the tire, mounted on the wheel rim, in a chamber sealed from the ambient atmosphere;

d. circulating steam at a temperature in the range of from 212°F. to 400°F., within the chamber in contact with the tire and rim for a predetermined desired period of time;

e. releasing the steam from within the chamber and maintaining the atmosphere surrounding the tire and rim substantially free of elemental oxygen for a predetermined desired period of time to let the material within the tire cavity at least partially foam; and

f. recirculating steam at a temperature in the range of from 212°F. to 400°F. within the chamber to again contact the tire and rim, the steps (e) of releasing the steam, and (f) of recirculating steam being repeated, if necessary, until the material within the tire is foamed and cured.

3,872,202

METHOD FOR BLOWING HOLLOW ARTICLES OF PLASTIC MATERIALS

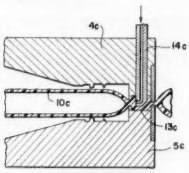
Claude Lafosse, Chalon-sur-Saone, France, assignor to Saint Gobain Industries, Neuilly-sur-Seine, France

Filed Apr. 26, 1972, Ser. No. 247,733

Claims priority, application France, Apr. 26, 1971, 71.14777

Int. Cl. B29c *17/07*

U.S. Cl. 264—89 3 Claims



1. The method of blowing a plurality of hollow articles from an elongated extruded tube of plastic material which comprises closing a plurality of successive molds formed by paired mold halves about contigous lengths of said tube to enclose in each said mold a hollow parison of plstic material and to form a mass of said material between and connecting adjacent said parisons, and sequentially acting upon each parison by directing a fluid first generally radially inwardly of said mold between the ends of said mass toward substantially the longitudinal axis of said mass and then generally axially to penetrate said mass along said axis to enter within the confines of and inflate said parison to a position juxtaposed to the walls of said mold.

3,872,203

METHOD FOR PRODUCING BIAXIALLY STRETCHED RECEPTACLES BY BLOW MOLDING

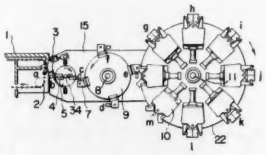
Shinsuke Yoshikawa, and Yuji Sawa, both of Fukushima, Japan, assignors to Kureka Kagaku Kogyo Kabushiki Kaisha and Mitsui Toatsu Chemicals Inc., both of Tokyo, Japan

Filed June 7, 1973, Ser. No. 367,927

Claims priority, application Japan, June 7, 1972, 47-56101

Int. Cl. B29c *17/07*

U.S. Cl. 264—94 1 Claim



1. A method for blow molding a parison to form receptacles, comprising the steps of:

a. heating a tubular parison cut to a predetermined length in a heating furnace while supporting said tubular parison on a supporting rod,

b. transferring said tubular parison from said heating furnace to a delivery rotary,

c. gripping a central portion of said tubular parison by movable jaws disposed on said delivery rotary, and maintaining said parison in a vertical position,

d. rotating said delivery rotary about a vertical axis to bring said tubular parison adjacent a stretching rotary;

e. transferring said tubular parison to said stretching rotary,

f. gripping each end of said tubular parison by stretching means disposed on said stretching rotary,

g. stretching said parison vertically by the stretching means at each end of said parison moving at equal speeds away from each other while rotating said stretching rotary continuously about a vertical axis to bring said parison adjacent a molding rotary having a plurality of openable molds adjacent its periphery,

h. placing a mold about a central portion of said parison,

i. separating the portion of said parison gripped by said stretching means from the portion retained by said mold,

j. releasing said separated portions from said stretching means at a predetermined position of said stretching rotary,

k. blow molding said parison while rotating said molding rotary about a vertical axis,

l. separating said molded article from said mold at a predetermined position of said molding rotary.

3,872,204

METHOD FOR CONTINUOUSLY MANUFACTURING SHAPED GYPSUM ARTICLES

Tsuyoshi Yano; Hiroshi Onishi, and Inahide Tanaka, all of Tokyo, Japan, assignors to Onoda Cement Co., Ltd., Onoda, Yamaguchi-ken, Japan

Filed Aug. 2, 1972, Ser. No. 277,372

Claims priority, application Japan, Aug. 5, 1971, 46-58674

Int. Cl. B28b *21/52*; C04b *11/00*

U.S. Cl. 264—102 4 Claims

1. A method for continuously manufacturing shaped gypsum articles comprising mixing 100 weight parts of insoluble anhydrite with from 0.5 to 2.5 weight parts of an alum as an accelerator for the setting, from 3 to 10 weight parts of bentonite, from 1 to 4 weight parts of alcohol selected from the group consisting of methyl alcohol and ethyl alcohol, and from 20 to 30 weight parts of water; kneading the mixture to obtain a doughy paste; extruding the doughy paste to obtain a contin-

uous band of shaped dough through a die wherein the extruding pressure is substantially 10 to 12 Kg/cm² cutting said band

into a number of shaped soft articles; and causing said articles to set at room temperature and atmospheric pressure.

3,872,205

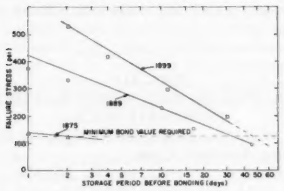
MOLDING PROCESS FOR BONDING INSULA IN RACHET MOTOR CASING

Jacques Ratte, and Jean Bigras, both of Quebec, Quebec, Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defense

Division of Ser. No. 149,303, June 2, 1971,. This application Oct. 12, 1973, Ser. No. 406,046

Int. Cl. B29d *3/02, 7/14;* **B29b** *9/11;* **F02k** *9/00*

U.S. Cl. 264—175 **3 Claims**



1. A process comprising mixing in a preheated mixer a carboxyl-terminated polybutadiene binder, a curing agent and a curing catalyst, admixing the mixture with a siliceous filler comprising from 50–80% by weight of asbestos fibers and 20–50% by weight of asbestos floats, partially curing to a dough of the required consistency for subsequent rolling and rolling the partially cured dough into a sheet and molding said sheet to the steel wall of a rocket motor casing by low pressure bag molding to effect bonding thereto and produce a partially cured insulant bonded to said steel wall.

3,872,206

ACETAL ADDITION TO VISCOSE OR AMGLOSE XANTHATE SOLUTIONS FOR THE MANUFACTURE OF CROSSLINKED SHAPED ARTICLES

Noel I. Burke, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Oct. 5, 1973, Ser. No. 404,053

Int. Cl. D01f *3/10, 3/14*

U.S. Cl. 264—188 **7 Claims**

1. In a method for the manufacture of a shaped article from a polymer selected from the group consisting of cellulose and amylose wherein said polymer is extruded as an alkaline solution as the xanthate through a die to form said shaped article, the shaped article passed into an acid bath for regenerating said polymer, and reacted with an aldehyde, the improvement which comprises adding to the alkaline solution and prior to extrusion a water-soluble acetal selected from the group consisting of the reaction product of a monohydroxy alcohol having from 1–7 carbon atoms and a monoaldehyde having from 1–7 carbon atoms, a monohydroxy alcohol having from 1–7 carbon atoms and dialdehyde compound having from 1–7 carbon atoms, and a monoaldehyde having from 1–7 carbon atoms and a dialkanol having from 1–7 carbon atoms.

3,872,207

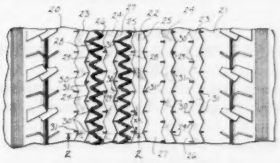
METHOD OF FORMING TIRE TREADS WITH ELONGATED TRACTION-AUGMENTING ELEMENTS

Paul J. Felker, 211 W. First St., Marshfield, Wis. 54449

Filed Mar. 17, 1970, Ser. No. 20,356

Int. Cl. B29h *17/00*

U.S. Cl. 264—277 **3 Claims**



1. In a method of forming non-skid tire treads with the use of a tire molding machine of a type which has a matrix provided with circumferentially-extending laterally-spaced ribs to provide rider strip-forming grooves therebetween, the steps of forming said ribs with zig-zag sides to provide alternating short peaks and valleys while maintaining a relatively straight clear space between ribs, inserting sipe-forming strips in said valleys of the matrix ribs to project transversely approximately the same distance as the altitude of said peaks, inserting elongated traction-augmenting members, each of a width to be received between the peaks of a pair of matrix ribs and of a width to be received in said clear space without substantial bowing, in substantially straight lines in said matrix grooves to extend around the circumference of the matrix whereby said members will be centered between peaks of the matrix ribs and between the ends of the sipe-forming strips, and then, while the traction-augmenting members are thus held, forming a tire tread with the traction-augmenting members in the rider strips thereof, whereby said tread has traction-augmenting members disposed circumferentially about said tire and completely embedded within the rider strips thereof.

3,872,208

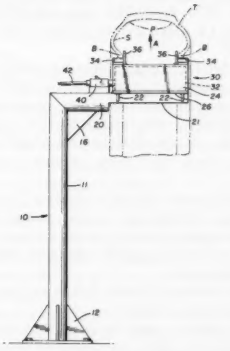
CORRECTIVE HEATING OF PNEUMATIC TIRES

Edward S. Brown; Rudy D. Henson; James D. Farris, all of Mayfield, Ky., and John A. Feola, Akron, Ohio, assignors to The General Tire and Rubber Company, Akron, Ohio

Filed July 24, 1972, Ser. No. 274,356

Int. Cl. B29c *25/00*

U.S. Cl. 264—346 **2 Claims**



1. In the method of heat treating a cured pneumatic tire suspended in an upright position such that the axis of rotation of said tire is substantially horizontal and an area indicative of

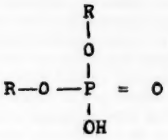
an undesirable radial force variation is located substantially vertically above said axis, the improvement wherein said heat treating, which results in a reduction in the magnitude of said force variation without adversly affecting the dimensional regularity of the tire, comprises applying heat directly only upon a portion of the inner surface of said tire adjacent said area until said inner surface reaches a maximum predetermined temperature not to substantially exceed about 240°F.

3,872,209
ION EXCHANGE PROCESS FOR THE RECOVERY OF METALS

Wayne C. Hazen, Denver, and Enzo L. Coltrinari, Arvada, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Filed Mar. 17, 1972, Ser. No. 235,623
Int. Cl. C01g *3/00*
U.S. Cl. 423—24 **13 Claims**

1. A process for the recovery of copper values from an aqueous medium comprising contacting said aqueous medium for a time up to about one minute with a mixed extraction reagent, the mixed extraction reagent comprising a water-immiscible organic solvent having dissolved therein a 2-hydroxy benzophenoxime having a solubility of at least 2% by weight in the organic solvent and an organophosphoric acid having the formula:



wherein R is selected from the group consisting of hydrogen, alkyl, aryl, and aralkyl and wherein not more than one R is hydrogen, to extract the copper values from the aqueous to the organic phase, separating said phases, and recovering the copper from the organic phase.

3,872,210
PROCESS FOR RECOVERING ANTIMONY VALUE OUT OF SPENT CATALYST

Rokuo Ukaji, and Toshio Shiomi, both of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Aug. 7, 1972, Ser. No. 278,201
Claims priority, application Japan, Aug. 11, 1971, 46-61153; Aug. 13, 1971, 46-61756; Aug. 14, 1971, 46-61910
Int. Cl. C01b *29/00*; **C22b** *31/00*
U.S. Cl. 423—87 **8 Claims**

1. A process for recovering antimony value out of spent antimony halide catalyst used in the fluorination of chloroalkanes, containing antimony trifluoride, antimony chlorfluoride, antimony trioxide, antimony pentoxide, a small amount of metal chloride, silicon dioxide and organic compounds which strongly adhere into spent antimony catalyst which comprises

contacting said spent catalyst with water or mineral acid with agitation to separate organic compounds strongly adhered or included in said spent catalyst as an under layer from an aqueous upper layer into which antimony value is transferred,

separating the resultant mixture into an aqueous upper layer and an organic under layer,

treating said aqueous upper layer with at least one metal selected from the group consisting of iron, manganese, copper, zinc, tin and their chloride, sulfate or nitrate salts, neutralizing the treated aqueous layer with an alkali converting the antimony value to insoluble antimony compounds for co-precipitation with insoluble antimony compounds present wherein the pH of the layer is from about 7 to 10,

adsorbing the residual antimony compounds into the co-precipitates and

recovering the antimony compounds such that the antimony ion is present in the waste water in an amount less than 1 p.p.m.

6. A process for recovering antimony value out of spent antimony halide catalyst used in the fluorination of chloroalkanes containing antimony trifluoride, antimony chlorfluoride, antimony trioxide, antimony pentoxide, a small amount of metal chloride, silicon dioxide and organic compounds which strongly adhere into spent antimony catalyst which comprises

contacting said spent catalyst with water or mineral acid with agitation to separate organic compounds strongly adhered or included in said spent catalyst as an under layer from an aqueous upper layer into which antimony value is transferred,

separating the resultant mixture into an aqueous upper layer and an organic under layer,

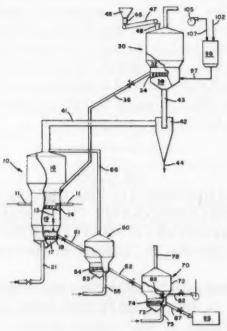
contacting said aqueous upper layer containing antimony value with at least one sulfide selected from the group consisting of hydrogen sulfide, sodium sulfide and ammonium sulfide under acidic conditions of about 0.001 to 4 N as hydrochloric acid and

recovering the antimony compounds such that the antimony ion is present in the waste water in an amount of less than 1 p.p.m.

3,872,211
CALCINATION OF HIGH MOISTURE CONTENT PHOSPHATE ROCK

Clarence J. Wall, Westport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Nov. 7, 1972, Ser. No. 304,350
Int. Cl. C01f *1/00*, *5/00*, *11/00*; **C22b** *3/00*, *79/00*
U.S. Cl. 423—167 **7 Claims**



1. A process for calcining phosphate rock containing 12% or more by weight of water while minimizing scaling in which the phosphate rock is moved serially through a plurality of fluidized beds to accomplish preheating, calcination and at least two stages of cooling, comprising the steps of, fluidizing a primary cooling bed with air from a first source of pressurized air to cool the phosphate rock, conducting the heated off-gases of said primary cooling bed to the calcination bed as the fluidizing gas therefor, passing the calcined, partially cooled phosphate rock from said primary cooling bed to a secondary cooling bed, fluidizing said secondary cooling bed

with air from an independent second source of pressurized air to further cool the phosphate rock, the fluidizing air stream for said secondary cooling bed flowing in parallel with the fluidizing air stream for said primary cooling bed and said calcination bed, mixing the high-temperature off-gases from the calcination bed with the cooler off-gases of said secondary cooling bed and conducting the mixed gases to the preheating bed as the fluidizing gas therefor.

3,872,212

SEPARATION OF POTASSIUM IONS FROM SODIUM IONS USING ALKANOLAMINES

Gilbert R. Atwood, Briarcliff Manor; Robert J. Blake, Yorktown Heights; Kenneth F. Butwell, Newburgh, and David A. Dunnery, New York, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 31, 1973, Ser. No. 365,684

Int. Cl. C01d *5/02;* **B01j** *17/04;* **C01d** *1/34*

U.S. Cl. 423—184 **8 Claims**

1. A method for the separation of potassium cations from sodium cations in an aqueous solution of potassium sulfate and sodium sulfate ranging from about 2 to about 25% salts by weight which comprises:

A. mixing the aqueous solution of potassium and sodium sulfates with from 0.05 to 100 parts by weight per part of said solution of an alkanolamine having 1 to 4 alkanol moieties and 2 to 6 carbon atoms in each moiety whereby more than 75% by weight of the potassium salt precipitates out of solution as crystalline potassium sulfate;

B. isolating the precipitated potassium sulfate from the mixture of (A);

C. removing water from the mixture remaining in (B) after isolation of precipitated potassium sulfate until the remaining salts precipitate out of solution; and

D. isolating the precipitated salts of (C).

3,872,213

METHOD FOR REMOVING HARMFUL COMPONENTS FROM EXHAUST GASES

Shigeru Haseba, Kobe, Japan, assignor to Kobe Steel Ltd., Kobe, Japan

Filed Aug. 30, 1972, Ser. No. 285,104

Claims priority, application Japan, Aug. 30, 1971, 46-066784

Int. Cl. B01d *53/00*

U.S. Cl. 423—213.7 **7 Claims**

1. A method for the catalytic conversion of harmful components in exhaust gases containing nitrogen oxides, carbon monoxides, hydrogen and hydrocarbons, which comprises:

charging oxygen or an oxygen containing gas into said exhaust gases in amounts sufficient to completely oxidize said hydrogen component but less than half the total quantity of oxygen needed to oxidize both the hydrogen and carbon monoxide components in said exhaust gases; introducing said oxygen containing exhaust gases into an oxidizing catalyst bed at a temperature of 50° – 300°C sufficient to oxidize said hydrogen in the exhaust gases and to remove all of said oxygen from said exhaust gases; introducing the exhaust gases issuing from said oxidizing catalyst bed into a nitrogen oxide reducing catalyst bed at a temperature above 300°C to reduce the nitrogen oxides present in the exhaust gases;

admixing the exhaust gases issuing from said reducing catalyst bed with additional oxygen or oxygen containing gas; and

introducing said admixture into a second oxidizing catalyst bed at a temperature of 100° – 700°C to oxidize any remaining carbon monoxide and hydrocarbons in said exhaust gases.

3,872,214

PROCESS FOR THE TREATMENT OF WASTE GASES FROM THE SEPARATION OF BORON

Gunter Kratel, Sankt Mang; Gunter Stohr, Kempten am Gohlenbach; Gunter Wiebke, and Volker Frey, both of Munich, all of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Germany

Filed Mar. 16, 1972, Ser. No. 235,137

Claims priority, application Germany, Apr. 1, 1971, 2115810

Int. Cl. C01b *35/00*

U.S. Cl. 423—298 **5 Claims**

5. In a process for the treatment of waste gases resulting from the reaction of boron halides with hydrogen to produce boron, the improvement which comprises reacting said waste gases, at temperatures of the order of 300° to 900°C, with borides selected from the group consisting of alkali metal, alkaline earth metal and aluminum borides.

3,872,215

PHOSPHATE PURIFICATION PROCESS

Egon Cherdron, Limburgerhof/Pfalz; Hans-Joachim Forster, Schwetzingen-Hirschacker; Istvan Potencsik, Mannheim, and Manfred Haerter, Neuhofen/Pfalz, all of Germany, assignors to Gebruder Giulini GmbH, Ludwigshafen/Rhine, Germany

Filed June 16, 1971, Ser. No. 153,471

Claims priority, application Germany, June 16, 1970, 2029546

Int. Cl. C01b *15/16, 25/26*

U.S. Cl. 423—309 **13 Claims**

1. A method for producing pure phosphate from crude phosphoric acid, comprising the steps of:

a. mixing crude phosphoric acid with an alcohol or alcohol mixture having the ability to absorb at least 9 weight-% water as based on solution weight and which forms a water/phosphoric acid/alcohol phase, the volume ratio of the phosphoric acid to the alcohol being from the range 1:025 to 1:20, in the presence of at least one dissolved alkali or ammonium compound;

b. withdrawing from step a) the water/phosphoric acid/solvent phase;

c. mixing with the water/phosphoric acid/solvent phase of step b) at least one basic compound selected from the group consisting of alkali oxides, alkali hydroxides, alkali carbonates, alkali phosphates, ammonia, ammonia hydroxides, and ammonium salts, in an amount equal to 1 to 40 weight-% calculated as oxide and based on the amount required for producing monoalkali — or monoammonium-orthophosphate from the phosphoric acid present in said water/phosphoric acid/solvent phase thereby removing inorganic impurities from said water/phosphoric acid/solvent phase;

d. withdrawing from step c) a purer water/phosphoric acid/solvent phase;

e. adding to the water/phosphoric acid/solvent phase of step d) a basic compound for causing at least the said monoorthophosphate to pass from said water/phosphoric acid/solvent phase of step d) into an aqueous phase; and

f. recovering said aqueous phase containing said monoorthophosphate; wherein the temperature in steps a) through e) is from 5° to 100°C.

3,872,216

METHOD FOR PRODUCING PHOSPHATE CATALYST

Revekka Vulfovna Kachalova, ulitsa Krylenko, 5, kv. 194; Mark Semenovich Nemtsov, prospekt Gagarina, 21, kv. 8, and Galina Fedorovna Balkhanova, ulitsa Telmana, 48, korpus 3, kv. 60, all of Leningrad, U.S.S.R.

Filed July 17, 1972, Ser. No. 272,622
Int. Cl. C01b 25/26, 15/16
U.S. Cl. 423—313 4 Claims

1. A method for producing tertiary phosphates of Group II metals, useful as a catalyst for selective rupturing of

$$\geq C - O -$$

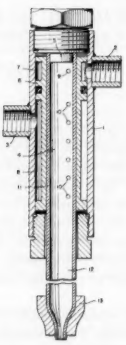
bonds in organic compounds, and, in particular, for splitting 4,4-dimethyl-1,3-dioxane into isoprene and for dehydration of alcohols, comprising reacting, at a temperature not exceeding 25°C., an aqueous solution of a salt of a Group II metal and a water-soluble salt of phosphoric acid in the presence of an amount of ammonia exceeding the stoichiometric amount required for the formation of tricalcium phosphate by 20–50 mole % per anion of phosphoric acid incorporated therein; and recovering the resulting tertiary phosphate.

3,872,217

PROCESS FOR THE MANUFACTURE OF SUBSTANTIALLY SPHERICAL, SILICA-CONTAINING HYDROGELS

Gerhard Merz, Frankenthal; Heinz Gehrig, Buerstadt, and Wilhelm Chorbacher, Neustadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Jan. 24, 1972, Ser. No. 220,142
Int. Cl. C01b 33/16
U.S. Cl. 423—338 6 Claims



1. A process for forming substantially spherical, silica-containing hydrogels which comprises: feeding a dilute mineral acid to the upstream end of a continuous-flow mixing zone; adding waterglass of sodium or potassium to said dilute acid at various points distributed along the downstream path of said dilute acid at temperatures of from 5° to 45°C, the dilute acid and the waterglass being fed to the mixing zone in such an amount that the silica hydrosol formed in the mixing zone reaches a pH of from 5 to 10; and spraying said silica hydrosol into a gaseous medium to form droplets of hydrosol which solidity to a spherical silica hydrogel while freely falling, whereby said spherical silica hydrogel is formed without any substantial incrustration taking place in the mixing zone chamber and in the orifice through which said reactant passes to said mixing zone apparatus.

3,872,218

SYNTHESIS OF ALKALI METAL TETRACARBONYLFERRATES

James P. Collman, Stanford, and Stanley R. Winter, Irvine, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 232,247, March 6, 1972,.
This application June 11, 1973, Ser. No. 368,496
Int. Cl. C01g 1/04, 49/16
U.S. Cl. 423—417 5 Claims

1. A method of producing a tetracarbonylferrate $M_2Fe(CO)_4$ wherein M is Na, K or a mixture of the two, said method comprising reducing an iron carbonyl with the metal M in elemental form in a solvent and in the presence of an electron carrier A capable of the reactions (a) and (b),

(a) $2M + 2A \rightarrow 2M^+ + 2A^-$
(b) $2A^- + Fe(CO)_5 \rightarrow Fe(CO)_4^= + 2A$

3,872,219

PROCESS FOR MANUFACTURING OF CHLORINATED LIME SOLUTION

Walter J. Sakowski, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Sept. 26, 1973, Ser. No. 400,872
Int. Cl. C01b 11/06; C01f 11/28, 11/24
U.S. Cl. 423—474 18 Claims

1. A method of inhibiting the solubilization of iron from lime during the chlorination of an aqueous slurry of lime, which comprises chlorinating said slurry of lime in the presence of an iron solubilization inhibiting proportion of an alkali metal compound selected from the group consisting of alkali metal silicates and alkali metal hydroxides, wherein said iron solubilization inhibiting proportion is equivalent to from about 0.1 to about 8 percent by weight of said lime on a dry basis.

3,872,220

PROCESS FOR THE PRODUCTION OF LITHIUM CHLORIDE

William Novis Smith, Jr., Exton, Pa., assignor to Foote Mineral Company, Exton, Pa.

Filed Jan. 24, 1974, Ser. No. 436,195
Int. Cl. C01d 11/02
U.S. Cl. 423—499 12 Claims

1. A process for the production of lithium chloride substantially free of lithium salts of chlorine oxygen acids through substantially quantitative conversion of chlorine in a gas stream to said lithium chloride which comprises:

a. absorbing chlorine from a gas stream in a substantially saturated aqueous solution of lithium hydroxide until the lithium hydroxide solution has been substantially completely converted to a solution of lithium chloride containing lithium salts of chlorine oxygen acids;
b. adding ammonia to said solution of lithium chloride while maintaining said solution at a temperature of from about 0° to about 100°C. to reduce lithium hypochlorite and lithium chlorite present in said solution to lithium chloride;
c. reducing the pH of said lithium chloride solution to about pH 1.5, and adding an organic reducing agent selected from the group consisting of formaldehyde, oxalic acid and hydroxylamine hydrochloride to said solution while maintaining the temperature thereof at about 80°C. to reduce lithium chlorate and lithium perchlorate present in said solution to lithium chloride; and
d. recovering lithium chloride.

3,872,221

METHOD FOR PRODUCING ANHYDROUS SODIUM HYDROSULPHITE USING SODIUM FORMATE, FORMIC ACID OR FORMIC ACID ESTER

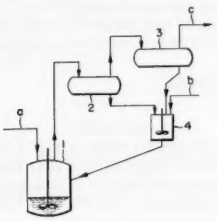
Yoshio Yoshikawa, Ushiku-Machi, Ibaraki-ken, and Takeo Suzumori, Niijuku-Machi, Tokyo-fu, both of Japan, assignors to Mitsubishi Gas Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1973, Ser. No. 418,452

Claims priority, application Japan, Nov. 28, 1972, 47-118528

Int. Cl. C01b *17/98*

U.S. Cl. 423—515 2 Claims



1. In a method for producing anhydrous sodium hydrosulphite by the reaction of sodium formate, formic acid or formic acid ester with sodium hydroxide and sulphur dioxide or sodium bisulphite in an aqueous solution of alcohol, under reflux of formic acid ester which is boiled off from the reaction solution, the improvement comprising the steps of adding sodium hydroxide to formic acid ester which is condensed for reflux and returning the resulting mixture to the reaction solution.

3,872,222

PROCESS FOR PRODUCING METAL SULPHIDE CRYSTALS

Hubert L. Barnes, State College, Pa., assignor to Crysdyn Corporation, Washington, D.C.

Continuation-in-part of Ser. Nos. 249,136, Jan. 3, 1963, abandoned, and Ser. No. 697,017, Jan. 11, 1968, abandoned. This application Oct. 1, 1970, Ser. No. 77,359

Int. Cl. C01g *13/00*, *9/08*; C01b *17/20*

U.S. Cl. 423—561 20 Claims

1. A method of growing single isometric metal sulphide crystals of high purity which have a dimension of 25 microns or more comprising:

a. forming a saturated aqueous metal sulphide crystallizing solution that has a pH of 6 to 14 at a reference temperature of 25°C comprising compounds that form metal bisulphide complex ions, HS^- ions, dissolved H_2S and an excess amount of metal sulphide nutrient, in which (1) at a pH above 7 the HS^- ion is the predominant sulfur containing ion in solution and (2) at a pH between 6 and 7 contains dissolved hydrogen sulphide which is predominant in solution but the HS^- ion concentration is not less than 1/10th of the H_2S molar concentration in the solution; and

b. after said crystallizing solution reaches a chemical equilibrium between said metal bisulphide complex ion, said HS^- and said metal sulphide, subjecting said crystallizing solution to a chemical potential gradient that causes the metal bisulphide complex ion to dissociate to form more metal sulphide which initiates the formation and the growth of metal sulphide crystals in the crystallizing solution.

3,872,223

IMPROVEMENTS IN DUAL TEMPERATURE EXCHANGE PROCESS

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Filed Mar. 22, 1971, Ser. No. 126,623

Int. Cl. C01b *5/02*

U.S. Cl. 423—580 13 Claims

1. In a method for producing a fluid phase containing a first material concentrated therein, by exchanging at different temperatures said first material with a second material between chemically different first and second fluid phases which are physically separable from each other and which are each capable of containing each of said materials, said materials being isotopic, said method being of the type in which

a. said second fluid phase is passed through each of second and first units, in that order, of a pair of exchange units,

b. said first fluid phase is caused to flow in countercurrent contact with said second fluid phase in each of said first and second units of said pair,

c. said first and second units are maintained at different temperatures to cause: (1) said second fluid phase to become progressively enriched in said first material in said second unit, and to become progressively impoverished in said first material in said first unit of said pair: and (2) said first fluid phase to become progressively enriched in said first material in said first unit and to become progressively impoverished in said first material in said second unit of said pair of units, and

d. enriched fluid passing between said units is withdrawn, the improvement which comprises:

e. increasing, in a part of said second unit, the proportionate amount of first fluid phase in contact with the second fluid phase after said second fluid phase has reached an increased level of enrichment of said first material therein, while

f. decreasing, in a part of said first unit, the proportionate amount of first fluid phase in contact with the second fluid phase after said second fluid phase has reached an increased level of impoverishment of said first material therein

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3,872,224

PROCESS FOR THE PRODUCTION OF BERYLLIUM HYDRIDE

Byron R. Lowrance, Birmingham, Mich., and Jesse Roger Mangham, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

Filed Aug. 24, 1964, Ser. No. 392,371

Int. Cl. C01b *6/00*

U.S. Cl. 423—64 8 Claims

1. A process for the preparation of beryllium hydride which comprises pyrolyzing a dialkylberyllium compoud, wherein each alkyl group contains up to about 12 carbon atoms in admixture with a catalytic quantity of a product modifier selected from the group consisting of lithium hydride and an organic lithium compound capable of providing lithium hydride upon pyrolysis.

3,872,225

PROCESS OF VIRAL DIAGNOSIS AND REAGENT

John A. Coller, Merion; Irving Millman, Willow Grove, and Baruch S. Blumberg, Philadelphia, all of Pa., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

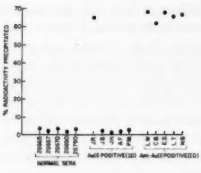
Continuation of Ser. No. 33,327, April 30, 1970, abandoned. This application July 12, 1972, Ser. No. 271,051

Int. Cl. A61k *27/04*

U.S. Cl. 424—1 29 Claims

1. A process of determining the presence of human anti-Au(1) antibody to Australia antigen Au(1) in human serum, which comprises incubating radioactively labeled Australia

antigen Au(1) and an unknown sample of human serum to form antibody-bound labeled antigen if the unknown sample of human serum contains human anti-Au(1) antibody, adding heterologous anti-human gamma globulin, then centrifuging



to precipitate the radioactive complex and thus getting separation between the antibody-bound labeled antigen and unbound materials, and measuring the radioactivity of at least one of the materials mentioned above as separated from each other.

3,872,226

TC–99M ALBUMIN AGGREGATES WITH STANNOUS TIN AND DENATURED ALBUMIN

Thomas Albert Haney, East Brunswick; Gerald Anthony Bruno, Shrewsbury, and Janeth Bartlett, East Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 164,456, July 20, 1971, abandoned. This application June 23, 1972, Ser. No. 265,849

Int. Cl. A61k *27/04*; **G21h** *5/02*

U.S. Cl. 424—1 **9 Claims**

1. A macroaggregate of Technetium–99m, denatured albumin and stannous tin.

3,872,227

FORMULATION FOR ORAL ADMINISTRATION OF PENICILLINS HAVING IMPROVED TASTE PROPERTIES

Dieter Hoff, Leverkusen, and Kurt Bauer, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 28, 1973, Ser. No. 336,478

Claims priority, application Germany, Mar. 8, 1972, 2211019

Int. Cl. A61k *21/00*

U.S. Cl. 424—271 **20 Claims**

1. An orally administrable pharmaceutical composition which comprises in combination ampicillin and an amino acid selected from the group consisting of glycine, a mixture of equal parts of glycine and alanine and a mixture of equal parts of glycine and β-alanine, in the proportions of 0.3 to 10 parts by weight of amino acid per part by weight of ampicillin.

3,872,228

PROCESS FOR THE PREPARATION OF FOOD CONTAINING PULLULAN AND AMYLOSE

Hiromi Hijiya, and Makoto Shiosaka, both of Okayama, Japan, assignors to Hayashibara Biochemical Laboratories, Incorporated, Okayama, Japan

Filed Jan. 14, 1974, Ser. No. 433,379

Claims priority, application Japan, Jan. 19, 1973, 48-8406

Int. Cl. A21d *13/02*, *13/06*

U.S. Cl. 426—19 **4 Claims**

1. A method of preparing a baked food which comprises:
   a. mixing cereal flour, amylose having 20 to 500 glucose units per molecule, and pullulan with enough water to form a dough,
      1. the weight ratio of said pullulan to said flour in said dough being between 2:1 and 1:5,
      2. the amount of said amylose in said dough being between 30 to 170 percent of the weight of said pullulan; and
   b. baking said dough.

3,872,229

FOOD COMPOSITION HAVING A NUT-LIKE TEXTURE AND METHOD FOR PRODUCING THE SAME

Jack R. Durst, Osseo, and Warren L. Ganske, Golden Valley, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation of Ser. No. 172,337, Aug. 12, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,747

Int. Cl. A23c *1/18*, *1/00*

U.S. Cl. 426—62 **13 Claims**

1. A process for making a nut-like product which comprises intermixing about 1.5 to 32 percent by weight of an edible, hydratable film-forming substance with about 25 to about 85 percent by weight of an edible, water-immiscible, oleaginous material in liquid form, and water in the amount of from about 13.5 to about 67 percent by weight to hydrate the film-forming substance, beating to disperse the water-immiscible oleaginous liquid and form a continuous cellular film which isolates and entraps globules of the oleaginous liquid thereabout, near the beginning of mixing maintaining the dispersion free from exposure to gas and maintaining the mixture free from exposure to gas to the end of mixing whereby the oleaginous material is dispersed homogeneously in the continuous phase composed of said edible film-forming substance under conditions which exclude air and then slowly drying the cellular film to a moisture content of about 10% or less while preserving the continuity thereof.

3,872,230

METHOD FOR PRODUCING FOOD COMPOSITIONS HAVING A NUT-LIKE TEXTURE

Joseph M. Sinner, Bloomington; Edward L. Galle, St. Paul; Joseph F. Kolosky, Minneapolis, and Marvin O. Mikkelson, Brooklyn Park, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation of Ser. No. 225,943, Feb. 14, 1972, abandoned. This application Feb. 25, 1974, Ser. No. 445,695

Int. Cl. A23j *3/00*

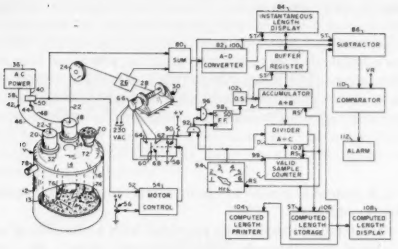
U.S. Cl. 426—98 **11 Claims**

1. A process for making a nut-like product which comprises intermixing about one part by weight of a hydratable film-forming substance comprising heat stabilized wheat germ flour, about three parts of an edible water immiscible oil and from about 13.5–67 percent by weight water, beating for a period of time sufficient to disperse the water-immiscible oil and cause the film forming substance to coalesce into a continuous cellular phase which isolates and entraps globules of the oil while maintaining the dispersion at a vacuum of between about 24 and 29 inches of Hg gauge and then slowly drying the cellular film in two stages while preserving the continuity thereof.

3,872,231
SYSTEM FOR DETERMINING ELECTRODE LENGTH

James W. Motter, and Connie A. Allen, both of Huntsville, Ala., assignors to Toroid Corporation, Huntsville, Ala.

Filed May 23, 1974, Ser. No. 472,555
Int. Cl. H05b *7/12;* **F27d** *11/10*
U.S. Cl. 13—13 **4 Claims**



1. A system for measuring the length of an electrode suspended in an arc furnace comprising:

suspension means for suspending a said electrode in a furnace;

electrical force indicating means coupled to said suspension means for providing an electrical output representative of the force reflected on said suspension means by said electrode.

elevation means for selectively raising and lowering said electrode in said furnace;

current sensing means for providing an output signal representative of the current flow through said electrode;

summing usumming means responsive to the output of said force indicating means and said current sensing means for providing an output generally indicative of the length of said electrode;

analog-to-digital conversion means for periodically providing a signal representative of instantaneous length;

accumulating means responsive to the output of said analog-to-digital conversion means for sequentially, at selected times, summing instantaneous lengths provided by said analog-to-digital conversion means;

counting means for providing an accumulated count responsive to the lengths accumulated by said accumulator means;

division means responsive to a dividend signal from said accumulating means and a divisor signal from said counting means for providing as a quotient a signal representative of the average lengths of the sample lengths accumulated; and

means responsive to said division means for indicating a said average length.

3,872,232
WATER-COOLED FLEXIBLE RISER TUBE CABLE TERMINAL

Daniel J. Goodman, 23236 Westbury Dr., St. Clair Shores, Mich. 48080

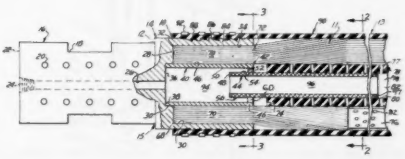
Filed Jan. 11, 1974, Ser. No. 432,431
Int. Cl. H01b *7/34*
U.S. Cl. 174—19 **7 Claims**

1. A cable terminal adapted to be connected to a cable conductor assembly including a multiplicity of flexible stranded wire conductor ropes surrounding a central flexible coolant conduit within the flexible tubular casing of a water-cooled electric arc furnace cable, said terminal comprising

a terminal body having a cup-shaped head portion containing a socket and having an electrical connection portion projecting outward from one end of said head portion away from said socket,

and an elongated riser tube structure having an outer component with an outer end secured to said body centrally within said socket and defining with said socket an annular cavity adapted to receive the outer ends of the conductor ropes and also adapted to receive means for securing the conductor ropes to said head portion,

said body having a coolant passageway therethrough communicating with said outer end of said riser tube structure,



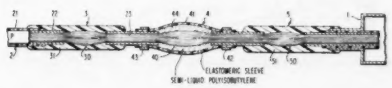
said riser tube structure having an inner component disposed in coaxial end-to-end relationship with said outer component and adapted to be inserted in the outer end portion of the central flexible coolant conduit,

said riser tube structure having connecting means joining the outer end portion of said inner component with the inner end portion of said outer component and having coolant bypass means disposed adjacent said connecting means and effecting coolant bypass flow from said outer component exteriorly of said inner component and also exteriorly of the flexible coolant conduit into the flexible tubular casing.

3,872,233
SEALED CONNECTION DEVICE FOR A CABLE

Lucien Rocton, Malakoff, France, assignor to Compagnie Industrielle Des Telecommunications CIT-ALCATEL, Paris, France

Filed Nov. 14, 1973, Ser. No. 415,795
Claims priority, application France, Nov. 14, 1972, 72.40314
Int. Cl. H02g *15/00*
U.S. Cl. 174—23 R **9 Claims**



1. A sealed connection device for a cable under gaseous pressure, said cable including covering means enclosing a harness of electrically insulated conductors subjected to the pressure of an inert internal gas, said sealed connection device comprising:

sleeve means enclosing a bared zone of the conductor harness of the cable, said sleeve means including an outer covering of an elastomeric substance,

a viscous chemically neutral liquid contained inside said sleeve means in contact with the conductors, said viscous liquid being under a pressure greater than the gaseous pressure in the cable, and

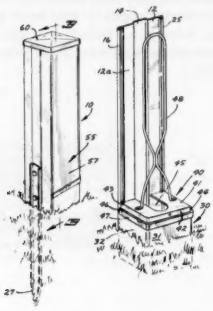
sealing means sealing the ends of said sleeve means onto the cable.

3,872,234

ELECTRICAL CABLE PEDESTAL STRUCTURE

Robert L. Smith, Minnetonka, Minn., assignor to Roart Plastics, Inc., Hopkins, Minn.

Filed Feb. 11, 1974, Ser. No. 441,437
Int. Cl. H02g 9/02
U.S. Cl. 174—38 8 Claims



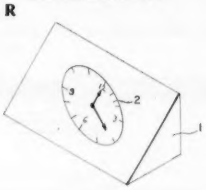
1. A pedestal enclosure to receive an above-ground cable splice of an underground wiring system having in combination an upstanding plate member forming a housing support,
- an interlocking groove formed along each side of said plate member,
- a ground anchored means having said plate member secured thereto,
- a base housing member, a pair of interlocking tongue portions integral with said base housing member and respectively interengaging said grooves,
- a cable splice support upstanding from said base housing member,
- an upper housing member carried by said plate member and said base housing member, and
- means removably securing said upper housing member to said plate member and said base housing member.

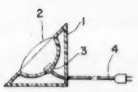
3,872,235

INFLATABLE HOUSING FOR AN ELECTRICITY CONSUMING DEVICE

Frank W. Manly, Jr., Dalton, Ga., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 4, 1974, Ser. No. 439,301
Int. Cl. H05k 5/00
U.S. Cl. 174—52 R 8 Claims





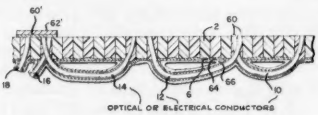
1. In combination, an electricity consuming device and an inflatable housing for said electricity consuming device comprising a sheet of material forming an inflatable triangular enclosure, said sheet having an opening in one face thereof for exposing said electricity consumer device, means within said housing to an electrical energy source, and means integral with said sheet of material to inflate said sheet and form said enclosure.

3,872,236

BONDED WIRE I INTERCONNECTION SYSTEM

Robert Charles Swengel, Sr., York; Timothy Allen Lemke, and, Frederick Phillip Villiard, both of Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 152,140, June 11, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 314,062
Int. Cl. H05k 3/20
U.S. Cl. 174—68.5 5 Claims



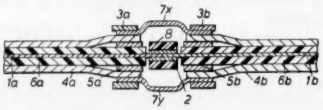
1. A system of point - to - point interconnected transmission lines, comprising:
- a relatively thin substrate provided with a plurality of apertures therethrough defining discrete point - to - point locations on said substrate;
- a plurality of transmission line lengths bridging between discrete locations on said substrate,
- the end portions of said transmission line lengths protruding through said substrate apertures and terminating at a first planar surface of said substrate,
- intermediate portions of said transmission line lengths between the end portions of said transmission line lengths being looped over a second surface of said substrate which is opposite the planar surface of said substrate,
- a filler material comprising a solid substance within the apertures of said substrate and filling the spaces between the peripheries of said apertures and the peripheries of the end portions of said transmission line lengths,
- said filler material being confined entirely within said apertures and adhering to and forming portions of said substrate,
- said filler material adhering to and anchoring the end portions of said transmission line lengths within the confines of said apertures,
- said end portions of said transmission line lengths being provided with transverse end areas at said first planar surface of said substrate, said end areas comprising energizable signal energy planes integral with and on terminated end portions of said transmission line lengths, and said transmission line lengths are optical conductors.

3,872,237

JOINT FOR COAXIAL CABLE END

John Richard Eyre; Kenneth Richard Way, both of Kent, and David Neil Kielty, London, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,518
Claims priority, application United Kingdom, Apr. 10, 1973, 17122/73
Int. Cl. H02g 15/08
U.S. Cl. 174—88 C 4 Claims



1. A jointing arrangement for a coaxial cable core comprising a pair of cable ends including a pair of adjacent inner conductors, dielectric spacers surrounding said inner conductors at a distance from said ends, a pair of outer coaxial conductors around said spacers, an inner metal sleeve about the ends of said inner conductors, a dielectric sleeve about said

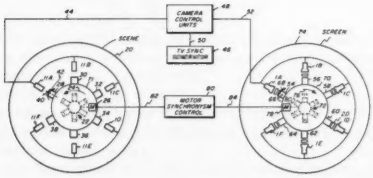
inner sleeve, a pair of reinforcing metallic sleeves around respective said dielectric spacers adjacent each end, said outer coaxial conductors surrounding said reinforcing sleeves, a plurality of like outer metallic tubular shells positioned to form a tubular enclosure about the adjacent inner conductors and inner sleeve, said tubular shell enclosure having a larger diameter midsection spaced from said dielectric sleeve and having narrower diameter outer ends, said outer ends of said enclosure encircling the respective ends of said outer coaxial conductors over said reinforcing sleeves, and a pair of outer metallic sleeves surrounding respective said outer enclosure ends, said outer sleeves being crimped to lock the tubular shell enclosure in position relative to said inner and outer conductors, the ratio of the inner diameter of said midsection of said tubular enclosure surrounding said inner conductors and inner sleeve to the outer diameter of said inner sleeve being selected to maintain the characteristic impedance of said inner and outer coaxial conductors.

3,872,238

360 DEGREE PANORAMIC TELEVISION SYSTEM

John W. Herndon, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 11, 1974, Ser. No. 450,125
Int. Cl. H04n *7/18*
U.S. Cl. 178—6 **4 Claims**



1. A **360°** panoramic television system for taking continuous images covering a **360°** scene and projecting the same on a 360° screen, the taking and projecting emanating along radii from central vertical axes respectively of said scene and screen comprising:

a plurality of stationary vertical, single line scan, camera tubes equally, angularly spaced and each aimed inwardly along an associated radius of said scene toward the vertical axis thereof;

a plurality of stationary vertical, single line scan, projectors equally, angularly spaced and each aimed inwardly along a radii of said screen toward the vertical central axis thereof;

amplifying and processing control until means connectd to pass video signal information from said cameras to said projectors;

a first optical system including a plurality of image collection optical prism and lens means and a second optical system including a plurality of image projection optical prism and lens means, each having rotatable mounting means for prism portions thereof and positioned respectively in relation to said cameras and projectors to pass images from said scene to said cameras and from said projectors to said screen, and

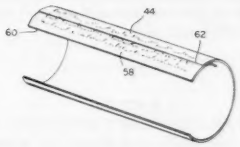
synchronized motor drive means for rotating said prism portions of optical systems in unison to produce a **360°** panoramic transfer of image to said screen.

3,872,239

FACSIMILE APPARATUS AND METHOD OF OPERATION

Richard L. Nelson, New York, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 20, 1973, Ser. No. 333,616
Int. Cl. H04n *1/08*
U.S. Cl. 178—6 **27 Claims**



18. A facsimile receiver for generating a copy in response to received signals representing the information content of an original document, said receiver comprising means for writing on a copy medium juxtaposed to said writing means, scanning means for moving said copy medium relative to said writing means along successive scanning paths, signal receiving means responsive to the signals received by said receiver for activating said writing means to reproduce the information content of the original document on said copy medium, the improvement residing in said copy medium comprising:

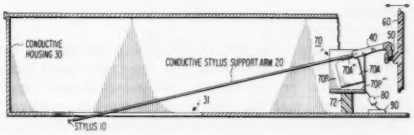
a closed loop of material moved relative to said writing means by said scanning means such that a continuous writing surface is juxtaposed to said writing means.

3,872,240

PICKUP APPARATUS FOR CAPACITIVE VIDEO DISC PLAYERS WITH TRANSMISSION LINE TUNED CIRCUIT

David John Carlson, Indianapolis, Ind., and Stephen Earl Hilliker, Tempe, Ariz., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,103
Claims priority, application United Kingdom, Mar. 26, 1973, 14395/73
Int. Cl. G11b *9/06*; **H04n** *5/76*
U.S. Cl. 178—6.6 R **10 Claims**



1. In a disc playback system including a stylus having a conductive electrode for establishing a variable capacitance with a disc record during playback the combination comprising:

a stylus support arm of conductive material providing at one end thereof support for said stylus;

a conductive housing for said arm having an aperture through which said one support arm end extends during disc playback;

means for pivotally supporting the other end of said stylus support arm within said housing;

means electrically coupled to said other end of said stylus support arm for capacity end loading a transmission line formed by said support arm and said housing, to form a tuned circuit including said transmission line, said capacity end loading means and said variable capacitance, said tuned circuit having a resonant frequency nominally subject to variation over a given range of frequencies in

response to the variations of said stylus-disc capacitance;

a source of oscillations at a nominal frequency in the immediate vicinity of said given range of frequencies;

means for supplying oscillations from said source to said tuned circuit;

amplitude detecting means coupled to said tuned circuit for developing signals representative of recorded information; and

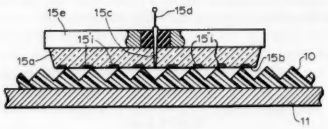
wherein said conductive stylus support arm has a length greater than a quarter-wavelength and less than a half-wavelength at said oscillation frequency and at the frequencies within said given range.

3,872,241

VIDEO DISC PICKUP WITH CAPACITIVE TRACKING

Robert Adler, Northfield, and Roger W. Knitter, Hoffman Estates, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed July 12, 1973, Ser. No. 378,467
Int. Cl. G11b *9/06*
U.S. Cl. 178—6.6 A **8 Claims**



1. An electrostatic pickup for sensing undulations formed in a pattern of grooves on the surface of a record disc to constitute a spatial representation and storage of the time variations of a signal to be reproduced, which disc further includes a conductive coating, said pickup comprising:

a body of insulating material having a bearing or tracking surface with a length much greater than the pitch of the record grooves;

a probe of conductive material extending through said body transversely of and intermediate the ends of said bearing surface and projecting into the plane of said bearing surface to sense the groove being tracked, said probe having a dimension measured along the direction of the groove that is small relative to the spatial wavelength of the signal stored on said disc;

a first family of capacitive conductive elements supported by said insulating body and extending in the direction of and adapted to overlie one section of said groove patterns; and

a second family of capacitive conductive elements also supported by said body and extending in the direction of and adopted to overlie a different section of said groove pattern,

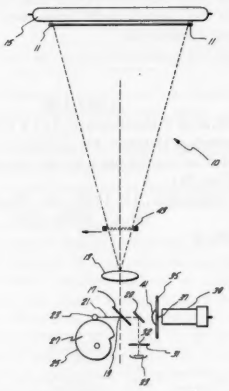
each of said capacitive conductive families of conductive elements individually exhibiting, with respect to the disc conductive coating, a capacitance having a predetermined reference value when said probe overlies the middle of a record groove being sensed but, each said family of elements exhibiting a different capacitance of a value which varies in sense and in amount in proportion to the radial displacement of said probe relative to the middle of the record groove being sensed.

3,872,242

FACSIMILE FLATBED TRANSCEIVER

Austin G. Cooley, Reno, Nev., assignor to Litton Medical Products, Inc., Elk Grove, Ill.

Filed May 4, 1973, Ser. No. 357,495
Int. Cl. H04n *1/10*
U.S. Cl. 178—6 **7 Claims**



1. A facsimile transceiver comprising:

a first film station positioned adjacent a source of illumination;

an objective lens positioned in front of said first film station along a focal axis;

a movable mirror on the other side of said objective lens for reflecting light beams impinging thereon;

first means for producing light signals and projecting said light signals onto said movable mirror, said first means comprising a recorder lamp and a first aperture plate positioned in front of said recorder lamp;

second means for receiving light beams from said illuminated film station and generating signals that are a function of the light intensity received, either of said first or second means being positioned along the optic axis with respect to said movable mirror with the other of said first or second means being positioned at an angle with respect to said optic axis, said second means comprising a second aperture plate and a phototube positioned behind said second aperture plate;

a stationary mirror detachably positioned along the optic axis with respect to said movable mirror to reflect light beams between said movable mirror and said means positioned at an angle to said optic axis, said stationary mirror being removable to enable light beams to pass between said movable mirror and said means positioned along said optic axis; and

a second film station detachably positioned between said first film station and said objective lens along said optic axis.

3,872,243
METHOD AND APPARATUS FOR CHECKING MEASUREMENTS MADE IN IMAGE ANALYSIS SYSTEMS

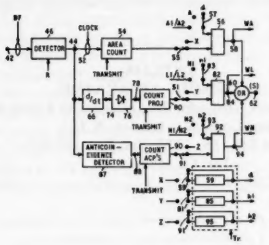
Michael Richard Soames, Fulbourn; William Ralph Knowles, and Donald William Braggins, both of Royston, all of England, assignors to Image Analysing Computers Limited, Melbourn, Royston, Hertsfordshire, England

Filed Apr. 28, 1972, Ser. No. 248,591

Claims priority, application United Kingdom, May 18, 1971, 15677/71; May 18, 1971, 15678/71

Int. Cl. H04n *7/18*

U.S. Cl. 178—6.8 **16 Claims**



1. A method of checking measurement made by an image analysis system performing a sequence of tests on similar fields, wherein each test includes

scanning an image of a field,

generating a video signal from the scanning,

detecting the video signal amplitude excursions to produce detected signal pulses,

making measurement on the detected signal pulses, comprising, in combination, the steps of:

inserting a check field,

scanning an image of the check field to produce a video signal thereof,

making measurements on the detected signal pulses resulting from the check field content, and

comparing the results obtained from the measurements made on the detected signal pulses for the check field with values obtained for the latter when the system is known to be operating correctly.

3,872,244
TELEVISION SYSTEMS

Ian Norman Vaughan-Jones, Wilmslow, England, assignor to Ferranti Limited, Hollinwood, Lancashire, England

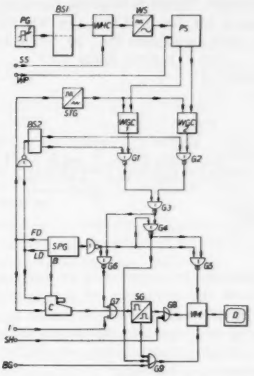
Filed June 26, 1973, Ser. No. 373,619

Claims priority, application United Kingdom, July 6, 1972, 31815/72

Int. Cl. H04n *7/18*

U.S. Cl. 178—6.8 **6 Claims**

1. A television system which includes means for electronically generating a wave-motion pattern including a variable-frequency oscillator operable at a frequency approximately equal to or the same as the television system line frequency, the variable-frequency oscillator including a high-speed bidirectional counter driven by a clock pulse generator and having its output compared with that of a variable-speed counter to generate a square-wave output from which the wave-motion pattern is derived, means for gating the signals representing the pattern with video and other signals to ensure correct overlay of the various components of a displayed picture represented by the various signals, and means for controlling



the shape and position of the wave-motion pattern relative to the other components of the picture.

3,872,245
PHOTOSENSOR ACTUATING DEVICE

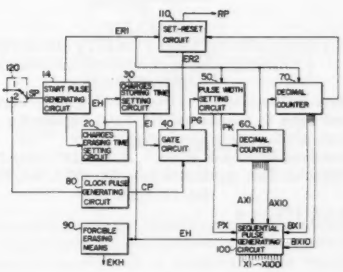
Akio Sagawa, and Hideaki Kawakami, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 30, 1973, Ser. No. 328,094

Claims priority, application Japan, Jan. 31, 1972, 47-10576; Mar. 8, 1972, 47-23184

Int. Cl. H04n *5/30*

U.S. Cl. 178—7.1 **3 Claims**



1. A photosensor driving system used for sequentially driving a plurality of photosensitive elements disposed in an array with output lines thereof forming a common output line connected to a common load resistor, the system comprising a plurality of pulse output lines each operationally coupled to each of said photosensitive elements, and pulse means for initially providing all of said pulse output lines with a pulse signal having a duration only sufficient to erase electric charges stored in said photosensitive elements and for providing after a predetermined period for storage of electric charges each of said photosensitive elements in a sequential order with a pulse signal having a duration only sufficient to read out optical information stored in respective ones of said photosensitive elements.

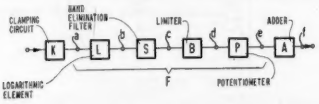
3,872,246
APPARATUS FOR ELIMINATION OF INTERFERENCE FROM VIDEO SIGNALS

Adolf Schneider, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 189,318, Oct. 14, 1971, Pat. No. 3,798,367. This application Dec. 20, 1973, Ser. No. 426,484

Int. Cl. H04n *5/21*

U.S. Cl. 178—7.2 **2 Claims**



1. An apparatus for eliminating an interference frequency, resulting from the frequency of the light illuminating the subject being photographed, from video signal transmission means having an image conversion means for receiving light from the subject and producing an electrical signal corresponding thereto, comprising:

optical means for diverting a portion of said light from the subject prior to the reception of same by said image conversion means, said light being modulated by said interference frequency,

means for converting said diverted light to electrical signals,

logarithmic amplifier means connected to receive the output of said converting means,

band-pass filter means connected to receive the output of said logarithmic amplifier and tuned to pass only said interference frequency and,

electro-optical modulator means having an optical input for receiving said light from the subject and an electrical input for receiving the output of said band-pass filter, the output from said band-pass filter modulating said light for removing said interference frequency therefrom, the optical output of said modulator means being optically coupled to said image conversion means.

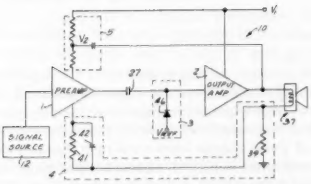
3,872,247
LOW COST OF HIGH FIDELITY HIGH POWER VARIABLE CLASS A AMPLIFIER-SPEAKER COMBINATION

Robert W. Saville, 108 Ahwahnee Rd., Lake Forest, 60045, and John C. Sanderson, III, 1400 Londen Ln., Glenview, both of Ill. 60025

Continuation-in-part of Ser. No. 145,257, May 20, 1971, abandoned. This application Feb. 20, 1973, Ser. No. 333,478

Int. Cl. H03f *1/00*

U.S. Cl. 179—1 A **6 Claims**



1. An amplifier circuit in combination with and connected to a speaker having a voice coil and a speaker cone, comprising:

an input amplifier stage for receiving input audio signals;

an output amplifier stage having an output terminal directly connected to said voice coil of said speaker and constantly providing a current through said voice coil;

capacitive coupling means connected between said input and output stages;

current feedback means for direct connection to said voice coil of said speaker and connected to said input stage, said feedback means including a low ohmic resistor connected in series with said voice coil; and

bias means connected to said capacitive coupling means and to said output stage for varying the bias on said output stage to allow a very low standby idle current while providing for the transmission of any applied signal whose peak-to-peak value is less than the supply potential, the current constantly provided through said speaker coil and the varying bias and the feedback current providing a linear acoustic response over the working range of said speaker.

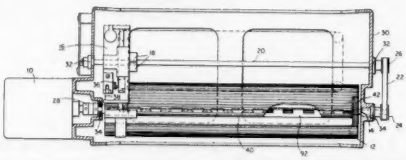
3,872,248
FACSIMILE APPARATUS

Luther R. Winters, Orlando, Fla., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 16, 1973, Ser. No. 332,927

Int. Cl. H04n *1/14*

U.S. Cl. 178—7.6 **14 Claims**



1. A facsimile system comprising:

a document-carrying drum having at least one surface discontinuity extending parallel to the axis of said drum;

means for mounting said drum for rotational motion about said drum axis;

means for driving said drum through said rotational motion about said drum axis;

a reading head;

means for supporting said reading head for movement along the surface of said drum in a direction parallel to said axis of said drum;

fiber optic scanning means mounted in a fixed position on said head for detecting the information content on a document carried by said drum; and

means for biasing said head toward said drum to allow said head to ride on the document carried by said drum thereby maintaining a fixed distance between said document and said fiber optic scanning means.

3,872,249
ENCODING METHOD FOR CONVERTING MULTI-CHANNEL SOUND SIGNALS INTO 2-CHANNEL COMPOSITE SIGNALS

Susumu Takahashi; Ryosuke Ito, both of Tokyo, and Koichi Hirano, Chiba, all of Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 427,932

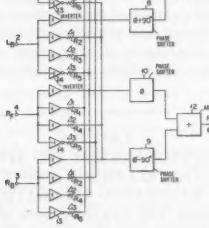
Claims priority, application Japan, Sept. 18, 1973, 48-10517

Int. Cl. H04r *5/00*

U.S. Cl. 179—1 GO **7 Claims**

1. An encoding method in which, in coupling to respective first and second channels at least first and second sound input signals associated with front channels and at least third and fourth sound input signals associated with back channels to generate first and second channel signals, said first, second,

third, and fourth sound input signals are coupled to the first and second channels with such an amplitude relation that the amplitude levels of said first and third sound input signals included in said first channel signal are greater than those of the first and third sound input signals included in the second channel signal and the amplitude levels of the second and fourth sound input signals included in said second channel are greater than those of second and fourth sound input signals included in the first channel signal, and in such a phase relation that the first and second sound input signals included in said first channel signal are in a substantially in-phase relation to the first and second sound input signals included in said second channel signal respectively and the third and fourth sound input signals included in said first channel signal is in a substantially opposite relation to the third and fourth sound input signals included in said second channel signal respectively: said encoding method comprising the steps of coupling said first sound input signal to said first channel at a relatively large amplitude level and at a reference phase shift angle and to said first channel at a relatively small amplitude level and at a phase shift angle corresponding to the reference angle plus 90°; coupling said first sound input signal to said second channel at a relatively small amplitude level and at the reference phase shift angle and to said second channel at a relatively small amplitude level and at a phase shift angle corresponding to the reference angle plus 90°; coupling said second input signal to said first channel at a relatively small amplitude



level and at the reference phase shift angle and to said first channel at a relatively small amplitude level and at the phase shift angle corresponding to the reference angle minus 90°; coupling said second sound input signal to said second channel at a relatively large amplitude level and at the reference phase shift angle and to said second channel at a relatively small amplitude level and at the phase shift angle corresponding to the reference angle minus 90°; coupling said third sound input signal to said first channel at a relatively large amplitude level and at a phase shift angle corresponding to the reference angle plus 90° and to said first channel at a relatively small amplitude level and at the reference phase shift angle; coupling said third sound input signal to said second channel at a relatively small amplitude level and at the phase shift angle corresponding to the reference angle minus 90° and to said second channel at a relatively small amplitude level and at a phase shift angle displaced 180° from said reference angle; coupling said fourth sound input signal to said first channel at a relatively small amplitude level and at the phase shift angle corresponding to the reference angle plus 90° and to said first channel at a relatively small amplitude level and at the phase shift angle displaced 180° from said reference angle; and coupling said fourth sound input signal to said second channel at a relatively large amplitude level and at the phase shift angle corresponding to the reference angle minus 90° and to said second channel at a relatively small amplitude level and the reference phase shift angle.

3,872,250

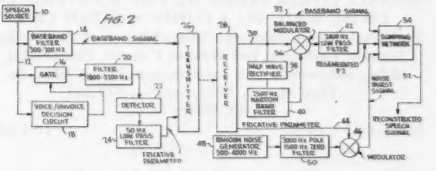
METHOD AND SYSTEM FOR SPEECH COMPRESSION

David C. Coulter, 9613 Pembroke Pl., Vienna, Va. 22180

Filed Feb. 28, 1973, Ser. No. 336,705

Int. Cl. G10l *1/10*

U.S. Cl. 179—1 SA **18 Claims**



1. A method of transmitting a speech signal in reduced bandwidth comprising the steps of transmitting a baseband signal having a frequency range including

the first formant;

receiving the baseband signal;

regenerating the second formant from the baseband signal by producing harmonics of the pitch frequency of the baseband signal, isolating at least one of the harmonics and processing the at least one harmonic with the baseband signal; and

combining the baseband signal with the regenerated second formant to reconstruct the speech signal.

3,872,251

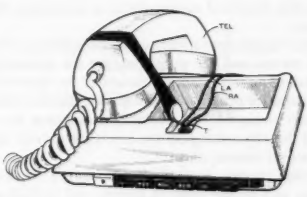
ELECTROCARDIOGRAPHY TRANSMITTER AND TRANSMISSION METHOD

Albert A. Auerbach, New York, N.Y.; George M. Katz, Leonia, N.J., and Sidney Steinberg, Bronx, N.Y., assignors to Medalert Corporation, New York, N.Y.

Filed Feb. 20, 1973, Ser. No. 334,078

Int. Cl. H04m *11/00*

U.S. Cl. 179—2 A **13 Claims**



1. Apparatus for use in transmission of electrocardiographic (EKG) signals derived from a patient, transmission being from the patient's location via a common carrier transmission means to a central location, the apparatus being normally in an inactive state, comprising an amplifier for amplifying the patient-derived EKG signals; reference signal generating means for generating a reference signal of predetermined amplitude; a frequency modulator operating at a carrier frequency within the audio range for frequency-modulating the carrrier with input signals to the modulator; a patient-operable switch momentarily operable for activating the apparatus; automatically timed switching means responsive to the momentary operation of the patient-operable switch for switching in as input signals to the modulator, the amplified EKG signals such that the amplified EKG signals and the reference signal are timewise juxtaposed; means for coupling the resultant frequency-modulated signal to the common carrier transmission means; a shut-off timing signal generator responsive to patient-operable switch for producing a shut-off timing signal having a given duration; and means responsive to the termina-

tion of the shut-off timing signal for automatically shutting off the apparatus to return it to the inactive state.

3,872,252

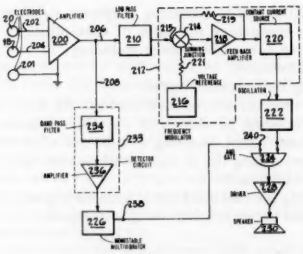
APPARATUS FOR MONITORING ELECTRICAL SIGNALS, EITHER ARTIFICIAL AND/OR NATURAL IN A LIVING BODY, VIA A COMMUNICATION LINK

Franklin Leonard Malchman, King of Prussia; Robert William Johnson, Levittown, and William J. Raddi, Philadelphia, all of Pa., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Mar. 7, 1973, Ser. No. 337,261

Int. Cl. H04m *11/00*

U.S. Cl. 197—2 A **16 Claims**



1. A transducer for monitoring electrical artifact signals of a living body resulting from artificial stimulation of a body part comprising:

a. sensing means connectable to the body for sensing electrical artifact signals in the body;

b. generating means for generating an electrical carrier signal;

c. output means operatively connected to the generating means and including means for producing an output signal in correspondence to the electrical carrier signal when the electrical carrier signal is coupled to the output means;

d. control means operatively connected between the generating means and the output means for normally permitting coupling to the output means of the electrical carrier signal and for modulating the the amplitude of the electrical carrier signal 100 percent in response to a control signal thereby cutting off the electrical carrier signal from the output means; and

e. channel means operatively connected to the sensing means and to the control means and including control signal producing means responsive to each sensed electrical artifact signal for providing a control signal for effecting operation of the control means to modulate the amplitude of the electrical carrier signal 100 percent.

3,872,253

SIGNAL TRANSMISSION AND SURVEILLANCE SYSTEM USING A SUBSCRIBER'S TELEPHONE LINE WITHOUT INTERFERING WITH NORMAL TELEPHONE LINE OPERATION

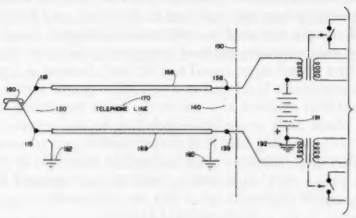
John J. Jurschak, 825 Casazza Dr., Reno, Nev. 89502

Continuation-in-part of Ser. No. 256,464, May 24, 1972, abandoned. This application Aug. 3, 1973, Ser. No. 385,277

Int. Cl. H04m *11/04*

U.S. Cl. 179—5 R **10 Claims**

1. An electronic signal transmission system comprising a first unit, said first unit comprising a transmitter, a second unit, said second unit comprising a receiver matched to said transmitter, a telephone transmission line having two wires, conductive means connecting said first unit to said telephone line, conductive means cooperatively connecting said second unit to said telephone line, a telephone, a telephone exchange, said telephone line connecting said telephone and said telephone exchange, said telephone and said telephone line and said telephone exchange together defining a telephone system, said telephone exchange causing a DC bias current on said telephone line when said telephone is electrically connected to said line, said first and second units being of sufficiently high and balanced impedance to telephone system AC voltage on said line as to substantially reduce attenuation of said telephone system AC voltage and unbalancing of said line by said units, said transmitter comprising low-frequency means for modulating said telephone line in a way which is discernible to said receiver, said first unit being adapted to receive an



event signal, said transmitter delivering a modulating signal current to said line in accordance with said event signal, said receiver delivering a counter-modulating signal current to said line in response to said modulating signal current, said counter-modulating signal current at least partially compensating for said modulating signal current and hence reducing voltage on said line due to said modulating signal current so as to reduce system modulation of the telephone system voltage on said line, said second unit providing an output signal related to said counter-modulating signal current, said output signal being electrically connectable to a suitable means for utilization.

3,872,254

REMOTE CONTROL SYSTEM AND APPARATUS FOR AUTOMATIC TELEPHONE ANSWERING AND RECORDING APPARATUS

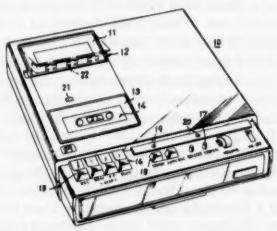
Masamichi Murata; Yuji Urayama, both of Yokohama, and Takamasa Furusawa, Shimizu, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 341,674, March 15, 1973, abandoned. This application June 4, 1973, Ser. No. 366,765

Claims priority, application Japan, Mar. 18, 1972, 47-27586; June 12, 1972, 47-68204; June 5, 1972, 47-55790; June 5, 1972, 47-55791

Int. Cl. H04m *1/64*

U.S. Cl. 179—6 E **3 Claims**



1. A remote control system for an automatic telephone answering and recording apparatus which includes first means for recording on and reproducing from a first cassette tape an answering statement, and second means for recording on and

reproducing from a second cassette tape incoming messages by callers; said system comprising:

a. answering means responsive to an incoming call arriving through a telephone line from a caller for automatically operating said first means to reproduce the answering statement previously recorded on said first cassette tape and for sending the statement through the telephone line toward the caller;

b. incoming message recording means responsive to completion of the reproduction of the answering statement by said first means for operating said second means to record on the second cassette tape incoming messages sent by the caller through the telephone line;

c. generating means for generating a plurality of kinds of pair tones comprising low tones and high tones;

d. detecting means responsive to a set of pair tones selected from the kinds of pair tones which are generated in sequence by said generating means and sent through the telephone line for producing a first control voltage only when the set of pair tones coincide with a predetermined set of pair tones;

e. first control means responsive to the first control voltage for driving said second means to rewind the second cassette tape;

f. second control means responsive to stopping of the rewinding of the second cassette tape for driving said second means to reproduce the incoming messages; after said detecting means produced the first control voltage, said detecting means producing a second control voltage in response to first digital component pair tones of the set of pair tones which first digital component pair tones are generated by said generating means with a duration shorter than a predetermined time duration and sent through the telephone line, a third control voltage in response to first digital component pair tones of the set of pair tones which first digital component pair tones are generated by said generating means with a duration longer than the predetermined time duration and sent through the telephone line, a fourth control voltage in response to second digital component pair tones of the set of pair tones which second digital component pair tones are generated by said generating means and sent through the telephone line, and a fifth control voltage in response to third component pair tones of the set of pair tones which third digital component pair tones are generated by said generating means and sent through the telephone line;

g. means responsive to the second control voltage for converting said second means to a recording mode;

h. means responsive to the third control voltage for recording a stop signal on the second cassette tape;

e. means responsive to the fourth control voltage for converting said second means to a play-back mode; and

j. means responsive to the fifth control voltage for converting said second means to a rewinding mode.

3,872,255
DIGITAL COMMUNICATIONS SYSTEM WITH TIME-FREQUENCY MULTIPLEXING

W. Franklin Nance, Oakdale, and Robert L. Shacklett, Fresno, both of Calif., assignors to NS Electronics and Vernon Creig Lenz, both of Fresno, Calif., a part interest to each

Filed May 14, 1973, Ser. No. 359,864

Int. Cl. H04b *7/18*

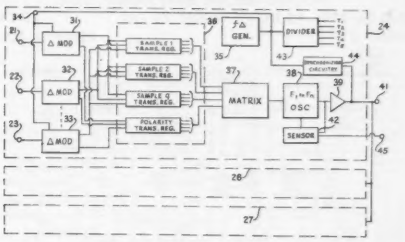
U.S. Cl. 179—15 BM **13 Claims**

1. A communication system having a plurality of inputs comprising

a plurality of first means sampling the change in signals at respective inputs simultaneously in repetitive intervals and producing for each input first pulses representing signal change and second pulses representing direction of change between successive intervals,

second means coupled to the output of said first means for combining pulses from a plurality of inputs to form binary words,

said second means including means registering and reading out said first pulses as said binary words to increase the readout time compared to sampling interval,



an address assignment matrix wired to receive said binary words, and

output means connected to said matrix for transmitting predetermined frequency bursts of energy at particular times as determined by said matrix as signals to a transmission medium that are decipherable into original input signals.

3,872,256
PCM TIME-DIVISION MULTIPLEX SWITCHING PROCEDURE

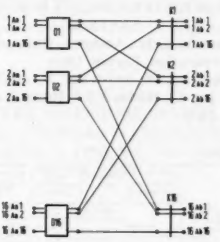
Max Schlichte, Munchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 18, 1973, Ser. No. 361,575

Claims priority, application Germany, May 26, 1972, 2225703

Int. Cl. H04j *3/00*

U.S. Cl. 179—15 AQ **1 Claim**

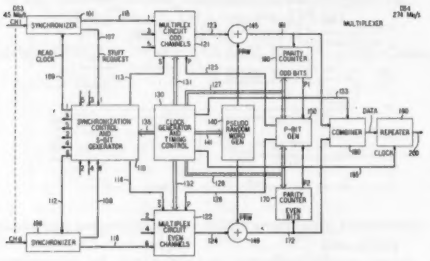


1. A method of selecting an outgoing time channel for permitting completion of a connection between incoming and outgoing time-division multiplex circuits transmitting PCM signals through a time division multiplex exchange installation having a plurality of through-connecting units each of which has low-congestion time channels, each of said through-connecting units including means for causing time channel conversion and spatial through-connection between said incoming and outgoing time division multiplex circuits, said through-connecting units being coupled to a spatial switching network to form a time-division multiplex coupling array with a time-space configuration, characterized by the steps of determining for the desired outgoing time-division multiplex circuit selected by the through-connecting unit the time channel of the available time channels which has previously been seized for the least number of outgoing connections, completing said outgoing connection over said channel determined to have previously been seized the least number of times.

3,872,257
MULTIPLEX AND DEMULTIPLEX APPARATUS FOR DIGITAL-TYPE SIGNALS

Werner Heinrich Bleickardt, and Richard Barker Robrock, II, both of Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 11, 1974, Ser. No. 450,203
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 BS **15 Claims**



1. Apparatus for combining a plurality of input data bit streams into a single output bit stream comprising:

means for generating a control bit of a first type in response to a first characteristic of said input data bit streams;

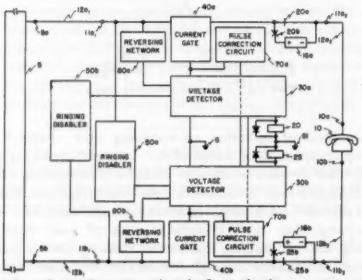
means for generating a control bit of a second type in response to a second characteristic of said input data bit streams; and

means for interleaving the data bits from said plurality of input data bit streams with said control bitis of said first and second types to produce sequential frame intervals of bits, each one of said frame intervals having a complementary pair of control bits of said first type and an equal pair of control bits of said second type at predetermined points within said frame interval.

3,872,258
VOLTAGE BOOSTER CIRCUIT FOR TELEPHONE SYSTEMS

Charles W. Chambers, Jr., Amherst, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed Jan. 28, 1974, Ser. No. 437,491
Int. Cl. H04m *3/24;* **H04b** *3/46*
U.S. Cl. 179—16 F **29 Claims**



1. A voltage booster circuit for telephone systems which comprises:

first and second office terminals for connection to a central office;

first and second subscriber terminals for connection to a subscriber line;

boost voltage supply means for increasing the magnitude of direct current flow in the subscriber line;

switching means for establishing a non-boosting path between the office terminals and the corresponding subscriber terminals, for establishing a first boosting path between one of the office terminals and the corresponding subscriber terminal through the boost voltage supply means to establish a first boosting condition, and for establishing a second boosting path between one of the office terminals and the corresponding subscriber terminal through the boost voltage supply means to establish a second boosting condition;

current gating means for detecting the presence and absence of normal d-c operating current in each conductor of the subscriber line;

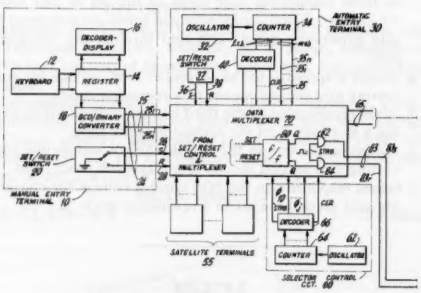
voltage detecting means for causing the switching means to establish the first boosting path when the current gating means detects the flow of normal d-c operating current from the subscriber terminal to the corresponding office terminal in one conductor of the subscriber line and normal d-c operating voltage is detected on the same conductor, for causing the switching means to establish the second boosting path when the current from the subscriber terminal to the corresponding office terminal gating means detects normal d-c operating current in another conductor of the subscriber line and normal d-c operating voltage is detected on the same conductor, and for causing the switching means to establish the non-boosting path when the voltage on both conductors of the subscriber line is substantially less than the normal d-c operating voltage thereof or when the current gating means fails to detect normal d-c operating current in either conductor of the subscriber line; and

means for connecting the voltage detecting means and the current gating means to each conductor of the subscriber line.

3,872,259
TRUNK TRANSITION SYSTEM

George Manos, Bridgeport, Conn.; Paul V. DeLuca, Port Washington, N.Y.; Vincent F. Santulli, Manhasset, N.Y., and William V. Carney, Valley Stream, N.Y., assignors to Porta Systems Corp., Roslyn, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,172
Int. Cl. H04q *1/18;* **H04m** *3/00*
U.S. Cl. 179—16 R **22 Claims**



1. In combination in a trunk transition system adapted to selectively implement connections between a first plurality of trunks, a second plurality of trunks and a third plurality of trunks, said second and third pluralities of trunks being ordered in one-to-one correspondence with said first plurality of trunks such that each of said first trunks may be connected to an associated one of the second or third plurality of trunks, a plurality of protective interface circuits in one-to-one correspondence with the first plurality of trunks, each of said protective interface circuits comprising first firm conduction means for connection to an associated one of said first trunks, second conduction means for connection to an associated one of said second trunks, and wire output means for connection to the associated one of the third trunks, data input entry

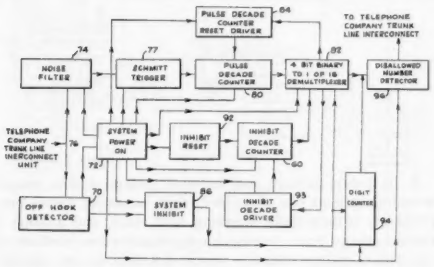
means for supplying an address identifying one of said protective interface circuits and one of said first trunks and for supplying the connection mode desired for said protective interface circuit and trunk, a plurality of trunk accessing modules, address decoding means responsive to the address supplied by said data entry means for signalling a particular one of said plurality of trunk access modules including switching means, mode implementing means responsive to the mode entered by said data entry means for signalling the mode desired by said entry means to each trunk access module, each trunk access module including switching means responsive to enabling signals from said address decoding means and said mode signalling means for selectively enabling switching means, said switching means at each of said trunk access modules connecting said first conduction means at an associated one of said protective interface circuits to either said second conduction means thereat or said wire means thereat.

3,872,260

TOLL CALL PROHIBITOR

Melvin Neal Oatis, Tustin, Calif., assignor to Telephonic Equipment Corporation, Santa Ana, Calif.

Filed Aug. 10, 1972, Ser. No. 279,713
Int. Cl. H04m *1/66*
U.S. Cl. 179—18 DA **7 Claims**



1. A combination of a telephone interconnecting means and a toll prohibiting module comprising:

a telephone interconnect for providing pulses from said telephone;

means for connecting said interconnect between said telephone and a central office trunk line;

connection means between said interconnect and said toll prohibiting module;

a relay within the circuit of said toll prohibiting module;

detection means within said toll prohibiting module for determining when the telephone receiver is off the telephone instrument, connected within said module to activate the toll prohibiting function;

means for providing power to said toll prohibiting module;

means connected within said module to said connection means for counting the total of the respective numbers being dialed on the telephone;

a separate means also connected within said module to said connection means from said total number counting means for counting the number of pulses from said telephone instrument which are being generated by the telephone in order to provide an indication of a discrete number being dialed; and,

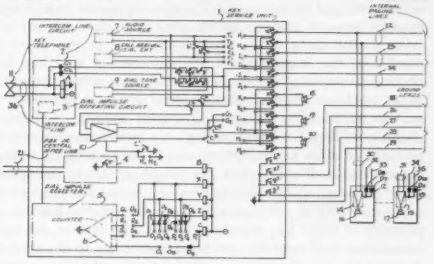
means to operate said relay to open a connection between said telephone instrument and said central office trunk in response to either a discrete number or a total of numbers from the telephone.

3,872,261

SWITCHING APPARATUS FOR USE IN A PAGING SYSTEM OF A KEY TELEPHONE SYSTEM

Tsuyoshi Shinoi, Kawasaki; Fumio Tsutsumi, Yokohama, both of Japan, and Stephen E. Kerman, Merrick, N.Y., assignors to Nippon Tsu Shin Kogyo K.K., Kawasaki-shi, Kanagawa-ken, Japan and TIE/Communications Inc., Stamford, Conn.

Filed Apr. 5, 1973, Ser. No. 348,130
Int. Cl. H04m *3/42*
U.S. Cl. 179—99 **6 Claims**



1. A switching circuit means for use in audible signal and intercom speech circuits of a key telephone system having a plurality of key telephone sets, each having an audible signal and an input terminal, an internal amplifier and a speaker; the switching circuit means comprising;

an audio signal generating means having a first output signal connected to a first terminal means;

a central office line circuit means having a second output signal connected to a second terminal means;

an intercom line circuit means having a third output signal from the intercom speech circuits of the key telephone system connected to a third output terminal; and

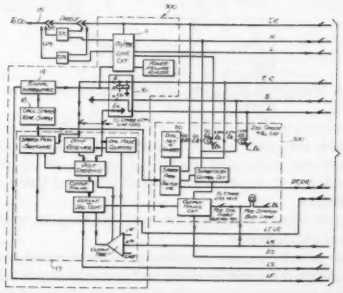
switching means connected between the three output terminal means and the input terminals of a preselected group of key telephone sets, the switching means disconnecting said audio signal generating means from said key telephone group in response to an output signal from one of said line circuit means and connecting the output of said line circuit means to said key telephone sets.

3,872,262

KEY TELEPHONE SYSTEM

Stephen Kerman, 1736 Poplar St., Merrick, N.Y. 11566

Filed Oct. 9, 1973, Ser. No. 404,694
Int. Cl. H04m *1/60*
U.S. Cl. 179—99 **1 Claim**



1. In a key telephone system comprising in combination a key service unit; a plurality of key telephone sets; at least one line circuit means for connecting said sets to an office line; at least one intercommunication line circuit means and intercommunication line circuit supervisory switching and control

means, including register circuit means, for effecting interconnection of any one key telephone set in the system to another; and further wherein each of said key telephone sets incorporates a microphone and a loudspeaker; transmission network means; dial apparatus means; means for supplying outgoing voice representative signals generated by said microphone to said trasnmission network means; means for supplying incoming voice representative signals, coupled to said transmission network, to said loudspeaker; and voice path switching circuit means for intercoupling said outgoing signal supplying means and said incoming signal supplying means to said transmission network and for maintaining said telephone set in its voice transmitting mode when said set is in the quiescent condition; the improvement wherein one of said key telephone sets serves all the other key telephone sets in the system as an operator attended station, said one key telephone set station additionally comprising circuit means, including a plurality of lamps, corresponding on a one-to-one basis to the plurality of other key telephone sets in the system, for indicating the status of each other key telephone set in the system; a like plurality of station selection key means and pairs of line conductor means, corresponding on a one-to-one basis to the plurality of other key telephone sets in the system, for interconnecting said operator attended station set to the plurality of other key telephone sets in the system; and means, responsive to the operation of a station selection key,

a. for automatically holding a line circuit means operatively connected to said attended station set,

b. for connecting the transmission network of said operator attended station set to the key telephone set corresponding to the operated selection key, over the corresponding pair of line conductors, and

c. for supplying a calling signal to said last mentioned key telephone set.

3,872,263

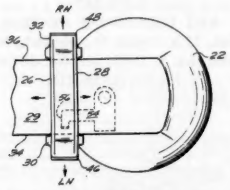
HAND-HELD DICTATE AND PLAYBACK INSTRUMENT

Leslie N. Wilder, New Rochelle, N.Y.; George L. Soltis, Shelton, Conn.; Theodore P. Nenninger, East Brunswick, N.J., and Anthony Ciaraldi, Stamford, Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Dec. 26, 1972, Ser. No. 317,929

Int. Cl. G11b *19/16;* **H01h** *9/00*

U.S. Cl. 179—100.1 DR **9 Claims**



1. A hand-held dictating and playback instrument comprising:

a housing provided with microphone and speaker means,

switch elements mounted within said housing adapted to actuate associated dictation equipment to selectively place said dictation equipment in one of three operating modes,

switch means mounted on said housing to actuate said switch elements.

said switch means comprising a yoke member pivotally mounted on said housing and pivotable from a first position wherein said switch means actuates said switch elements to place said dictation equipment in a first operating mode through a second neutral position to a third position wherein said switch means actuates said switch elements to place said dictation equipment in a second operating mode,

said switch means further including a single actuating means provided with a contact segment on opposed sides of said housing with each said contact segment being slidably disposed with respect to said housing and said yoke member, each said contact segment being movable from a first neutral position to a second position wherein said switch means actuates said switch elements to place said dictation equipment in a third operating mode, and

wherein said yoke member comprises a generally U-shaped member, each of the legs of said U-shaped yoke including an aperture therethrough to receive said actuating means to pivotally connect said yoke to said housing.

3,872,264

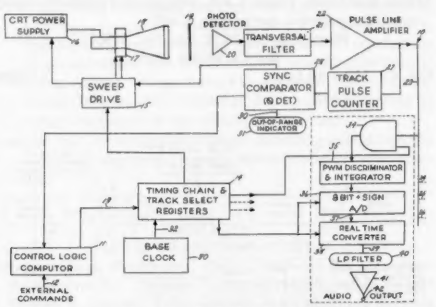
AUDIO RESPONSE DEVICE WITH ORTHOGONAL SCAN OF MULTIPLE TRACKS ON PLAYBACK

Mitchell A. Cotter, Riverdale, N.Y., assignor to APM Corporation, Englewood, N.J.

Filed Nov. 1, 1972, Ser. No. 302,822

Int. Cl. G11b *7/02*

U.S. Cl. 179—100.3 B **3 Claims**



1. In a data storage and retrieval system, a data record including at least one elongated track, scanning means progressively orthogonally scanning said track and passing a radiant energy beam through energy-transmissive portions of said track, energy detector means disposed on an opposite side of said record, and pulse width modulation means receiving the output of said energy detector means; said track comprising a first undulating elongated energy-transmissive area, second and third elongated non-energy-transmissive areas bordering said first area, and a fourth rectilinear energy-transmissive area bordering one of said second and third areas; whereby orthogonal scanning of said track may create a pulse width modulated signal determined by the instantaneous orthogonal spacing between said first and fourth elongated areas.

3,872,265

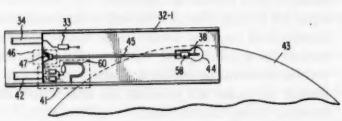
VIDEO DISC TRANSMISSION LINE AND STYLUS RF RETURN SYSTEMS

Stephen Earl Hilliker, Morresville, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 10, 1972, Ser. No. 295,854

Int. Cl. H04n *5/76*

U.S. Cl. 179—100.4 M **13 Claims**



1. An information playback system for recovering information recorded on a record medium, said information playback system comprising:

pickup means for establishing a reactance subject to variations in accordance with said recorded information;

a conductive support housing;

an elongated conductive member having first and second ends and being enclosed within said conductive support housing throughout at least a major portion of its length, said first end being pivotally mounted within said support housing so as to permit relative motion between said conductive member and said enclosing support housing, and said second end being mechanically and electrically coupled to said pickup means so that said conductive member mechanically supports said pickup means in a manner permitting motion of said pickup means relative to said housing, and so that a transmission line formed due to the electrical relationship between said conductive member and said enclosing support housing is electrically connected to said pickup means in a manner establishing a tuned circuit which includes the reactance exhibited by said transmission line and the reactance established by said pickup means.

3,872,266

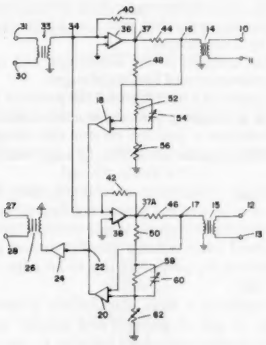
TELEPHONE MONITOR CIRCUIT

Vernon A. Baxter, Jr., Golden Valley, Minn., assignor to Magnetic Controls Company, Minneapolis, Minn.

Filed Dec. 13, 1973, Ser. No. 424,367

Int. Cl. H04m *3/22*

U.S. Cl. 179—175.2 C **4 Claims**



1. An electronic circuit for monitoring information carrying electrical lines with transmission and reception amplification comprising:

a first amplifying means having first and second opposite phased inputs;

a first coupling transformer between the information carrying lines and the first input to said first amplifying means; listening means connected to the output of said first amplifying means;

a second amplifying means with the input adapted to accept a transmission signal and the output connected through a resistance to said first coupling transformer; and

phase shifting means connected between the output of said second amplifying means and the second input to said first amplifying means so as to partially cancel out the signal from said second amplifying means fed back to the first amplifying means from the first coupling transformer.

3,872,267

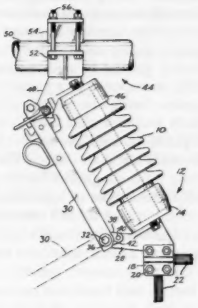
ELECTRIC SWITCH

James A. Kerr, Rt. 4, Box 319C, Hillsboro, Oreg. 97123

Filed Oct. 9, 1973, Ser. No. 404,423

Int. Cl. H01h *31/00*

U.S. Cl. 200—48 R **6 Claims**



1. An electric switch, comprising:

a. an elongated electric insulator,

b. an electrically conductive infeed terminal on one end of the insulator,

c. an electrically conductive outfeed terminal on the opposite end of the insulator,

d. an elongated, electrically conductive switch arm connected pivotally to the outfeed terminal for movement between a switch-closing position engaging the infeed terminal and a switch-opening position disengaged from the infeed terminal,

e. the infeed terminal having a connector section arranged for releasable attachment to an infeed bus for supporting the switch by the bus with the switch arm movable in a plane disposed substantially parallel to the infeed bus, and

f. the outfeed terminal having a connector section arranged for releasable attachment of an outfeed conductor.

3,872,268

TIRE PRESSURE DETECTING SWITCH

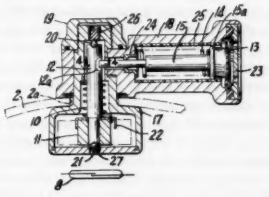
Shigeki Hata, Saitama-ken, Japan, assignor to Kanto Seiki Company Limited, Omiya-shi, Saitama-ken, Japan

Filed Jan. 4, 1974, Ser. No. 430,697

Claims priority, application Japan, Jan. 20, 1973, 48-6151[U]

Int. Cl. H01h *35/24*

U.S. Cl. 200—61.22 **7 Claims**



1. A tire pressure detecting device mounted on a vehicle wheel assembly including a rotatable wheel with a wheel rim carrying a tire and a stationary element supported on a wheel axle, comprising a revolving part secured to said rim for moving therewith along a circular path and a fixed part secured to said stationary element and disposed adjacent said circular path, said revolving part comprising a first housing portion extending through said wheel rim and a second housing por-

tion extending at an angle thereto at the side of said rim carrying said tire, said first and second housing portions being secured to and communicating with each other, a shaft member rotationally mounted in said first housing portion, and having an inner end portion projecting in the radial direction of said wheel, a magnet mounted on said inner end portion of said shaft member and producing a magnetic field, a spring means rotationally biasing said shaft member into an operative position, a movable member exposed on its one end to tire pressure and extending substantially tangential to said wheel rim and slidably guided in said second housing portion and being movable in response to a pressure drop in said tire, said movable member being engageable with said shaft member to lock said shaft member and said magnetic member in said inoperative position, said movable member being movable upon tire pressure drop to unlock the said shaft member to permit turning said magnetic member into said operative position under the action of said spring means, and a guide element received in said second housing for guiding said movable member and made of a material having a low coefficient of friction to insure an instantaneous response of said movable member to said tire pressure variations even under very high centrifugal forces, said fixed part comprising a switch element responsive to said magnetic field of said magnetic member while in said operative position, to produce a signal for a warning system.

3,872,269

ELECTRIC SWITCHES

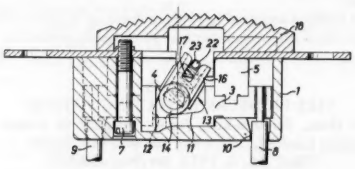
Hans Wernhard Schneider, Castle Works, High St., Old Woking, Surrey, England

Continuation of Ser. No. 315,498, Dec. 15, 1972, abandoned. This application Mar. 1, 1974, Ser. No. 447,337

Claims priority, application United Kingdom, Dec. 22, 1971, 59560/71

Int. Cl. H01h *13/28*

U.S. Cl. 200—67 AA **3 Claims**



1. An electric switch including a casing; a pair of fixed contacts mounted therein in longitudinally spaced relationship; a lever having a stem and mounted within said casing, said lever having a combined longitudinal rocking and sliding movement; a slot at one end of said stem; a moving contact in the form of a roller carried by said lever and in permanent rolling engagement with one of said fixed contacts and longitudinally movable as a result of combined rocking and sliding movement of said lever into engagement with the other fixed contact to bridge said contacts and complete an electrical circuit; a spring engaged with said stem and urging said roller into engagement with its associated fixed contact; a plate closing said casing; a longitudinally movable actuating slide coupled with said plate; a cross pin carried by said slide cooperating with said slot and locking said slide in coupled relative sliding relationship with respect to said cover, said spring acting against said cross pin, said slide being adapted to impart the rocking movement to said lever carrying said roller and at the same time compress said spring and to move said lever longitudinally through a dead center position and permit said spring to impart a quick longitudinal sliding and rocking movement to said lever and its associated roller and make or break the electrical circuit with a quick snap action.

3,872,270

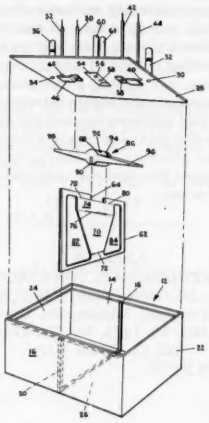
PNEUMATIC FLIP-FLOP RELAY

Charles R. Bond, 2241 Boston, S.E., Grand Rapids, Mich. 49506

Filed Oct. 3, 1973, Ser. No. 403,208

Int. Cl. H01h *35/34*

U.S. Cl. 200—83 P **25 Claims**



1. A bistable snap-action toggle relay comprising:

a sealed housing separated into compartments has been inserted by a diaphragm;

switch means coupled to the diaphragm and operated by buckling movement of said diaphragm;

means for applying a differential fluid pressure to opposite sides of said diaphragm to cause movement of said diaphragm between a position on one side of said housing and a position on the other side of said housing and vice versa;

said diaphragm comprising a relatively thin, stiff toggle member normally of flat planar configuration and means for resiliently buckling said toggle member laterally of the plane thereof when a force parallel to said plane is applied substantially perpendicular to an edge of said diaphragm; and

means for applying a force substantially perpendicular to said edge of said diaphragm and parallel to the plane thereof to buckle said toggle member to one side of said housing.

3,872,271

VACUUM CIRCUIT INTERRUPTOR INCLUDING A GETTERING DEVICE

Jan Christiaan Clason, Hengelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Filed Oct. 17, 1973, Ser. No. 407,041

Claims priority, application Netherlands, Oct. 18, 1972, 7214103

Int. Cl. H01h *33/02*

U.S. Cl. 200—144 B **1 Claim**

1. A vacuum circuit interruptor comprising:

a vacuum tight housing;

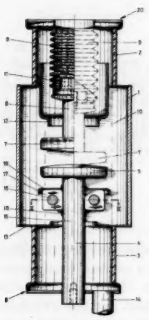
a stationary rod;

stationary and movable contact members positioned within said vacuum tight housing, said stationary contact member being mounted on said stationary rod;

a gettering device arranged within said vacuum tight housing for absorbing any gases which may be released during operation of the circuit interruptor and may be introduced through leakage, in order to maintain the desired

vacuum, said gettering device including an annular iron core arranged about said stationary rod;

transformer means having as its primary winding, said stationary rod and as its secondary winding, a plurality of metal sheets arranged around said annular iron core and



transferring an electric current flow from the current interruptor through said primary winding to said secondary windings; and

gettering material being deposited as layers on said metal sheets so as to be heated by the electric current through said metal sheets, which act as said secondary windings.

3,872,272

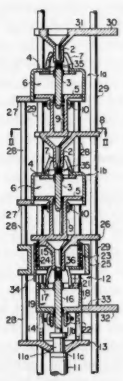
CIRCUIT BREAKER

Yoshio Yoshioka, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 20, 1973, Ser. No. 352,993

Int. Cl. H01h *33/70*

U.S. Cl. 200—148 A **10 Claims**



1. A circuit breaker comprising:

at least two electrically series connected breaking units each comprising at least a pair of contactors performing arc-inducing breakage or detachment, compressor means for compressing an arc-extinguishing gas, and nozzle means for blowing a highly pressurized arc-extinguishing gas compressed by the compressor means against the arcs generated between the pair of contactors;

a single electromagnetic driving means including a primary coil and a shorting ring or shorting coil electromagnetically coupled to the primary coil;

current diverting means adapted to be operated by an external operating means in accordance with a breaking instruction for diverting a current to be broken into the electromagnetic driving means; and

connecting means for electrically insulatedly connecting the electromagnetic driving means and movable portions of the breaking units so that the moving portions of the breaking units can be driven.

3,872,273

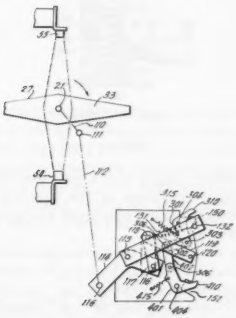
SWITCHGEAR OPERATING MECHANISM OVERCENTER SPRING TOGGLE WITH LATCHED RESTRAINT

Philip C. Netzel, Milmont Park, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Oct. 15, 1973, Ser. No. 406,473

Int. Cl. H01h *5/00*

U.S. Cl. 200—153 G **5 Claims**



1. In switchgear having at least one movable contact and a complementary contact; operating mechanism for moving the movable contact into engagement with the complementary contact and out of engagement therewith;

said operating mechanism comprising:

an operating link connected to said movable contact and movable in one direction to cause said movable contact to engage said complementary contact and in the opposite direction to disengage the same;

a rotatable lever; a pivot for said lever; a first end of said lever being connected to said operating link;

a first toggle comprising a first toggle link connected at one end to the other end of said lever, a toggle pin for said toggle; said first toggle link being connected at its other end to said toggle pin; said first toggle having a second toggle link connected at one end to said toggle pin and pivoting stationarily at its other end;

an operating handle; said operating handle being connected at its inner end to and rotatable about the pivot of said rotatable lever;

a tension spring between the outer end of said operating handle and said toggle pin;

rotation of said operating handle to a position wherein the said spring extends between the outer end of said operating handle and the lever point on a line on one side of the toggle pin causing said first toggle to collapse in that direction and correspondingly rotate said rotable lever thereby moving the operating link to operate the movable contact in one direction;

rotation of said operating handle to a position wherein said spring extends on the opposite side of said toggle pin thereafter causing collapse of said first toggle in the

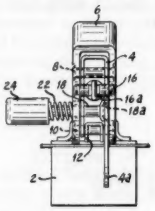
opposite direction to operate the movable contact in an opposite direction;
and means for latching the said first toggle after it has moved in one direction to maintain the said toggle in that position;
and additional means operable by said handle when it has completed its movement in a direction to cause collapse of the toggle in an opposite direction, to release said latching means and permit collapse of said toggle in said opposite direction.

3,872,274

OFF LOCKING IN-LINE TRIGGER SWITCH

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Division of Ser. No. 316,343, Dec. 18, 1972, Pat. No. 3,829,645. This application Mar. 5, 1974, Ser. No. 448,413
Int. Cl. H01h *3/20*
U.S. Cl. 200—157 **1 Claim**



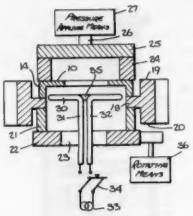
1. A self-enclosed trigger switch for a portable electric tool affording intended operation of the tool but automatically locking it against accidental operation whenever the switch is released comprising:
an insulating housing for the switch mechanism;
a trigger mounted to said housing for limited reciprocal sliding movement between an "on" position wherein the switch is in operation and an "off" position wherein the switch is not in operation;
a frame mounting said trigger to the top of said housing;
a return spring normally biasing said trigger into its extended "off" position and being depressible into its "on" position;
and an automatically engaging off lock for said trigger comprising:
a locking recess in the left side of said trigger having a keyhole shaped first depth forming a locking slot and a larger second depth forming a clearance slot for release of the lock;
a spring-biased locking pin mounted on the left side of said frame for limited axial movement with the right end thereof extending into said recess and the left end thereof having a pushbutton that is accessible for depression by the right hand thumb of the user:
a symmetrical enlarged locking head on said right end of said locking pin disposed within said recess;
said recess having an opening extending up to the top of the trigger affording access for said enlarged locking head on assembly of the trigger switch;
said locking slot being keyhole shaped so as to have a narrow section just wide enough to receive the stem of said locking pin but not the enlarged head thereof and a wider mouth portion at the entrance to said narrow section for receiving said enlarged head whereby said enlarged head abuts both sides of side mouth to lock said trigger in its "off" position and said locking pin spring to move the stem of said pin adjacent the narrow section of said locking slot and said enlarged head into said clearance slot to allow movement of said trigger to "on" position;
and the part of said trigger defining the upper side of said locking slot being at least partly confined against said frame to strengthen said off lock.

3,872,275

FORGE WELDING WITH INDUCTION COIL HEATING

Wallace C. Rudd, Larchmont, N.Y., assignor to Thermatool Corp., Stamford, Conn.

Filed Dec. 12, 1973, Ser. No. 424,004
Int. Cl. H05b *5/08*
U.S. Cl. 219—10.43 **14 Claims**

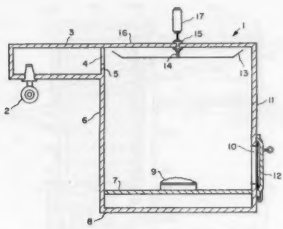


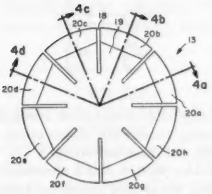
1. A method of forge welding together a first metal part at a surface thereof to a second metal part along a correspondingly shaped surface thereof at an elevated, forge welding temperature, each said surface extending around and being spaced from a predetermined point to form a closed, electrically conductive path having a pair of edges, one at one side of the path and the other at the other side of said path, the spacing between said edges on one said surface being substantially equal to the spacing between said edges on the other said surface and said surface of said first metal part being spaced from said point by substantially the same distance as said surface of said second metal part, at least one of said parts having metal extending from at least one edge of its said path in a direction away from said path, said direction being parallel to said surface of said last-mentioned one part, said method comprising placing said surface of one said part adjacent and facing said surface of the other said part to thereby provide a pair of facing surfaces; heating the metal at said facing surfaces to said forge welding temperature by inducing an alternating current in the metal at said facing surfaces with an induction coil closely adjacent said facing surfaces, said coil having a conductor extending at least partly around said point and having a shape in the circumferential direction around said point corresponding substantially to the shape in said circumferential direction of at least one said surface, the dimension of said conductor in said circumferential direction being the length thereof, the path of said current at the surface of said metal which is nearest said conductor having a predetermined width in a first direction substantially at right angles to said length dimension of said conductor and said conductor having a dimension in said first direction approximately equal to the desired dimension of said width of said path of the current flow in the metal to be heated to confine said current to a relatively narrow path in said last-mentioned metal, said current having a reference depth in said metal at said forge welding temperature at least equal to one-half the dimension, in a second direction substantially perpendicular to said first direction, of the metal intermediate said conductor and said edges of said facing surfaces which are farthest from said conductor; terminating said current when the metal at said facing surfaces reaches said forge welding temperature and while substantially all of said metal extending away from said edge of said surface of said first-mentioned one part is still at a lower temperature, said current being of a magnitude sufficient to so heat the metal at said facing surfaces to said forge welding temperature before a significant portion of said metal extending away from said last-mentioned edge reaches said forge welding temperature and being of a magnitude less than that which will cause the metal nearest said conductor to melt significantly during the time of flow of said current; and pressing said parts together at said surfaces with forge welding pressure at least when said metal at said facing surfaces has reached said forge welding temperature.

3,872,276
INCLUDING A SEMIRESONANT SLOTTED MODE STIRRER

Richard P. Corcoran, Hempstead; Alfred E. Hirtler, West Babylon, and Robert F. Mittel, Levittown, all of N.Y., assignors to North America Philips Corporation, New York, N.Y.

Filed Mar. 9, 1973, Ser. No. 339,539
Int. Cl. H05b 9/06
U.S. 219—10.55 H **16 Claims**





1. A microwave oven comprising a substantially closed metallic cavity adapted to hold an energy absorbing load, an aperture in a wall of said oven for coupling microwave energy into the oven cavity, means for generating and coupling microwave energy to said aperture, a field stirrer rotatably mounted in the cavity and comprising a thin metal disc having a plurality of radial slots arranged about its periphery to form a plurality of segments with the outer ends of at least some of said segments being bent out of the plane of the disc whereby said slots and segments form semiresonant elements which couple to the R.F. fields in the oven and reradiate the energy in various directions, and means for rotating said disc so that the bent ends pass near said aperture to intercept and reflect the microwave energy entering through the aperture so as to periodically change the mode pattern within the oven cavity.

3,872,277
SWITCH IN HALF-WAVE RECTIFIER CIRCUIT

Tokihide Niu, Takatsuki, Japan, assignor to Matsushita Electric Industrial., Ltd., Osaka, Japan

Filed Aug. 10, 1973, Ser. No. 387,244
Claims priority, application Japan, Aug. 11, 1972, 47-80513; Aug. 12, 1972, 47-80953
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 B **5 Claims**

1. In an electronic oven, a circuit comprising:

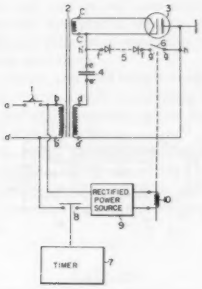
a. a transformer having primary and secondary windings, said primary winding being coupled to a power source,

b. a magnetron including a heater, a cathode and an anode, said anode being connected to a first terminal of the secondary winding of said transformer,

c. a capacitor connected between a second terminal of said secondary winding and the cathode of said magnetron,

d. a rectifier having an anode and a cathode,

e. a high voltage-control switch connected in series with said rectifier, said series-connected high voltage-control switch and rectifier being connected across the cathode and anode of said magnetron, the polarity of said rectifier being such that current is conducted from the connection of said series-connected circuit to the cathode of said magnetron to the connection of said circuit to the anode of said magnetron, and

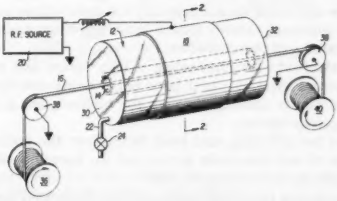


f. means operating said high voltage-control switch to open said rectifier circuit during a first predetermined time interval and close said rectifier circuit during a second predetermined time interval while said electronic oven is being used for cooking, said magnetron oscillating when said voltage-control switch is closed and not oscillating when said voltage-control switch is open.

3,872,278
METHOD FOR HEAT TREATMENT OF SUBSTRATES

Abraham A. Boom, Martinsville, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 185,014, Sept. 30, 1971, Pat. No. 3,780,255. This application Aug. 20, 1973, Ser. No. 389,502
Int. Cl. B23k 9/00
U.S. Cl. 219—121 P **6 Claims**



1. A method for heat treating substrates comprising the steps of:

providing electrically insulative means defining a gas impervious envelope having a central passage extending therethrough;

passing the substrate through said central passage to thereby create relative movement between the substrate and said central passage; and,

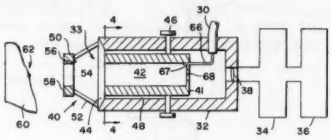
generating a gaseous plasma within said envelope without generating a plasma in said central passage, said substrate being heated at least indirectly by said plasma.

3,872,279

LASER-RADIO FREQUENCY ENERGY BEAM SYSTEM

Thomas E. Fairbairn, Westland, Mich., assignor to Sirius Corporation, Toledo, Ohio

Filed Oct. 24, 1973, Ser. No. 409,167
Int. Cl. B23k 9/00
U.S. Cl. 219—121 P 6 Claims



1. A coherent laser-radio frequency energy beam system for generating a high temperature beam and for directing the beam at a workpiece said system adapted to be used with a supply of low pressure inert gas; said system comprising:

a radio-frequency generator including a tank coil formed of a hollow, electrically conductive tube, both ends of said tube being electrically and mechanically coupled to said generator,

said inert gas being introduced into a maximum current-low voltage point of said tank coil,

said generator being for producing a single frequency coherent sine wave energy beam;

an electrically conductive nozzle having an opening at one end and an outlet orifice at said other end;

a hollow outlet tube connecting a maximum voltage-low current point of said tank coil with the interior of said nozzle;

means for generating a laser beam and for directing the laser beam into said nozzle opening;

hollow electrode means centrally mounted within said nozzle and being radially spaced-apart therefrom to define an annular gap therebetween;

said electrode for channeling a laser beam and the low pressure inert gas; said laser beam being directed from said nozzle opening through the hollow portion of said electrode means;

means for reflecting said laser beam from the hollow portion of said electrode means and for focusing said laser beam on said workpiece; and

a continuous fluid path being defined from said supply of inert gas, through said tank coil, said outlet tube, said electrode means and said annular gap;

whereby upon the application of said sine wave to said electrode means, the introduction of said inert gas into said fluid path, and the generation of said laser beam, a high temperature coherent electromagnetic energy beam is emitted from said electrode means;

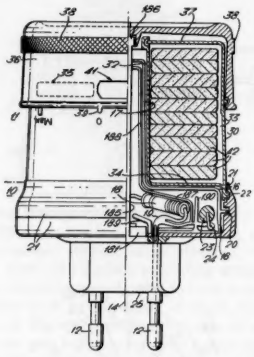
said coherent electromagnetic energy beam including a laser beam portion and a R.F. energy beam emitted from said electrode means and having an annular sheath of said inert gas for surrounding and focusing said beam and having an inner gas stream for conducting the electromagnetic energy to the workpiece.

3,872,280

DEVICE FOR VAPORIZING SUBSTANCES

Cornelis Jan Van Dalen, Doorn, Netherlands, assignor to Intergadgets AG, Zug, Switzerland

Filed Apr. 25, 1973, Ser. No. 354,231
Claims priority, application Switzerland, May 2, 1972, 6529/72; May 16, 1972, 7266/72; June 22, 1972, 9396/72
Int. Cl. F22b 1/28
U.S. Cl. 219—271 31 Claims



1. An electrically heated vaporizer comprising

1. a base having means for connection to an electrical power supply, the base including

a. a broad lower portion and a narrower elongated upper portion, the lower and upper portions constituting an enclosed housing, and

b. an electrical resistance heating means mounted in the enclosed housing and connected to the connection means,

2. an annular container and having an upper end and a lower end removably mounted on the base, the container having an inner and an outer wall defining therebetween a closed interior annular chamber extending substantially the length of the container,

a. the inner wall of the container fitting over the upper portion of the base,

b. annular carrier means carrying a substance to be vaporized arranged in the interior annular chamber of the container, and

c. a bell-shaped rotary member mounted on the upper end of the container,

d. the upper end of the outer wall of the container defining outlet port means for the substance vaporized by electrical heating and the rotary member defining corresponding port means arranged to be moved into register with the port means in the container wall by rotation of the rotary member whereby the latter port means may be gradually opened and closed upon said rotation.

3,872,281

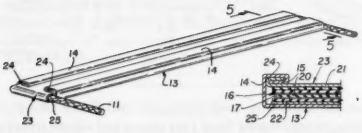
BAND TYPE ELECTRIC HEATERS

John W. Krieg; Alfred Gaudio, and Victor F. Borek, all of 3575 Lawson Blvd., Oceanside, N.Y. 11572

Filed June 5, 1974, Ser. No. 476,574
Int. Cl. H05b 3/58
U.S. Cl. 219—535 4 Claims

1. A band type electric heater comprising a heating unit having a generally flat elongated heating element with electrical leads means thereon, a first dielectric member abutting one side of said heating element, a second dielectric member abutting the opposite side of said heating element, a metallic heat conducting base member abutting said first dielectric

member, the opposite edges of said base member being folded in a 180° bend, a metallic heat conducting pressure band means abutting said second dielectric member, the opposite edges of said pressure band means being positioned within the folded edges of said base member and the thus interleaved



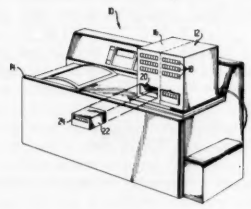
edges of said base member and said pressure band means being folded back into abutment with the outer surface of said pressure band means whereby said base member and said pressure band means are interlocked along their opposite edges.

3,872,282

COPY MACHINE RECORD SYSTEM FOR COST CONTROL

John R. Long, 7307 River Hill Rd., Oxon Hill, Md. 20021

Filed Nov. 8, 1973, Ser. No. 413,871
Int. Cl. B41l *39/02;* **G07c** *3/10*
U.S. Cl. 235—925 B **4 Claims**



1. In an accounting device used for allocating the cost of use of machines such as copying machines, computers, machine tools, printing presses, self-service gasoline pumps and the like to respective authorized users thereof, the combination comprising:

a housing;

a plurality of counters within said housing, each counter being associated with a different respective authorized user of the machine for storing a quantity which is a function of the cost of operating the machine by that authorized user;

a source of electrical power for powering said machine;

an electrical interlock disposed between said source of power and said machine for preventing use of said machine by unauthorized users;

enabling means for selectively defeating said electrical interlock to permit application of electrical power from said power source to said machine, said enabling means being actuatable by only authorized users of said machines;

at least one receptacle disposed in said housing, said one or more receptacles being adapted to receive said enabling means, the number of said receptacles being less than the number of counters disposed within said housing;

a source of electrical signals which are a function of the cost of operating said machine;

means coupled between said source of electrical signals and said plurality of electrical counters for selectively coupling said source of electrical signals which are a function of the cost of using said machine to the respective counter associated with a particular authorized user of the machine when that authorized user inserts said enabling means into said receptacle whereby said plurality of counters allocate the cost of operation of said machine on an authorized user basis;

said enabling means and said means coupled between said source of electrical signals comprising in part:

a plurality of portable cassettes at least equal in number to the number of said counters;

each cassette having a counter disposed therein; and

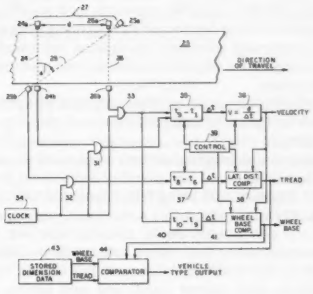
each of said counters being selectively connectable to said source of electrical pulses upon insertion of a different one of said cassettes into said receptacle.

3,872,283

VEHICLE IDENTIFICATION METHOD AND APPARATUS

Gerald R. Smith, and Oscar Jerome Brittingham, III, both of Atlanta, Ga., assignors to The Cadre Corporation, Atlanta, Ga.

Filed July 13, 1973, Ser. No. 378,988
Int. Cl. G06f *15/50;* **G08g** *1/015*
U.S. Cl. 235—150.2 **14 Claims**



1. Apparatus for determining the position of a vehicle as the vehicle moves along a path, comprising:

first means positioned with respect to the path for providing a first signal corresponding to the time required for the vehicle to move a predetermined distance along the path;

second means positioned with respect to the path to provide a second signal corresponding to the time required to travel between a first location normal to the direction of travel on the path and an intersection of a second location diagonal to the path; and

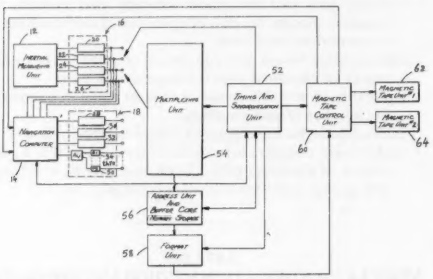
computing means connected to receive said first signal and said second signal and operative to provide a third signal as a function of the ratio which the second signal bears to the first signal, and which is thus a function of the lateral position of the intersection of the second location.

3,872,284

SHIPS INERTIAL NAVIGATION STORAGE AND RETRIEVAL SYSTEM (SINSARS)

Herbert L. Seligman, Brooklyn; Marvin Schwartz, Queens, and Warren Diamond, New York, all of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 18, 1972, Ser. No. 289,920
Int. Cl. G01c *21/20;* **G06f** *15/50*
U.S. Cl. 235—150.27 **2 Claims**



1. A ships inertial navigation storage and retrieval system comprising:

an inertial measuring unit;

a first plurality of buffer registers, said first plurality registers being connected to the output of said inertial measuring unit;

a navigation computer, said computer being connected to said inertial measuring unit for transferring inertial information from said inertial measuring unit to said navigation computer via said first plurality of buffer registers and said navigation computer having the capability of different rates of information processing and processing velocity, depth, and position information;

a second plurality of buffer registers, said second plurality of registers being connected to said navigation computer for transferring processed navigation information from said navigation computer to said second plurality of buffer registers;

a multiplexing unit, said multiplexing unit being connected to said first plurality and to said second plurality of buffer registers;

a timing and synchronization unit connected to said multiplexing unit and said first plurality and second plurality of buffer registers, and being interconnected to said navigation computer;

a memory unit connected to said multiplexing unit and interconnected to said timing and synchronization unit;

a magnetic tape control unit connected to said navigation computer, said memory unit, and said timing and synchronization unit; and

a plurality of magnetic tape units connected to said magnetic tape control unit.

3,872,285

CONTROL SYSTEM FOR SENSING THE VIBRATION AND LATERAL FORCE ON A CUTTING TOOL

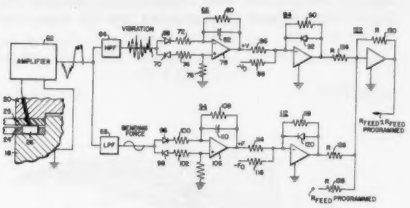
Lanson Y. Shum, Delmont; Leon J. Sienkiewicz, Export, and Theodore Gogniat, Monroeville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 31, 1974, Ser. No. 475,235
Int. Cl. B23g *11/04;* **G05b** *11/10*
U.S. Cl. 235—151.11 **5 Claims**

1. A control system for sensing the vibration and lateral force on a cutting tool supported in a chuck mounted on a machine comprising:

transducer means, mounted in proximity to said cutting tool, in response to mechanical force to produce electrical signals;

means coupled to said transducer means for separating said electrical signals into vibration and force component signals;



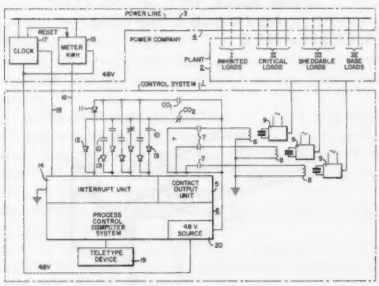
means for summing said vibration and force components with a programmed feed rate reference signal to produce a summed adaptive control signal which is continuously modulated in accordance with the instantaneous vibration and force experienced by the cutting tool.

3,872,286

CONTROL SYSTEM AND METHOD FOR LIMITING POWER DEMAND OF AN INDUSTRIAL PLANT

Richard E. J. Putman, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1973, Ser. No. 406,067
Int. Cl. G06f *15/06;* **G05b** *15/00*
U.S. Cl. 235—151.21 **3 Claims**



1. In a control system for holding to a demand limit at the end of a billing period the power demand of an industrial plant having a plurality of interruptible loads, including means for providing an indication of power consumption of said loads during a billing period; means responsive to said means for providing an indication of power consumption for predicting a demand at the end of said billing period; means responsive to said demand predicting means for providing a demand error relative to said demand limit; means for selecting a suitable amount of power; comparator means responsive to said demand error providing means and to said power selecting means for establishing a residual error relative to said demand limit; and means responsive to the output of said comparator means for load control; the combination of:

means for setting switching constraints to at least part of said loads thereby to define among said interruptible loads and at times during said billing period, loads of controllable status and loads of non-controllable status;

said load control means including means for switching a load of a switchable amount of power in response to the sign of the output of said comparator means;

means for indicating the switching status of said loads at anytime during said billing period;

said power selecting means including priority means operative with a priority list of loads of controllable status and in accordance with the output of said switching status indicating means;

said power selecting means being operative in response to said residual error during successive decision periods within said billing period to provide a switchable amount of power from said priority list;

said switching means being operative in response to said power selecting means during such said decision period and operative in response to said constraint setting means before such said decision period; and,

wherein said demand predicting means is responsive to operation of said constraint setting means before any such said decision period.

3,872,287
METHOD OF, AND APPARATUS FOR, DETERMINING RADIATION ENERGY DISTRIBUTIONS

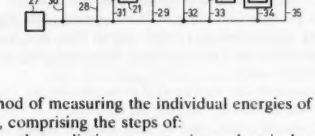
Henriecus Koeman, Amsterdam, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed July 26, 1972, Ser. No. 275,320

Claims priority, application Netherlands, July 30, 1971, 7110516

Int. Cl. G01t *1/15;* **G06g** *7/18*

U.S. Cl. 235—151.31 **7 Claims**



1. A method of measuring the individual energies of radiation quanta, comprising the steps of:

converting the radiation quanta into electrical current pulses;

integrating the current pulses to produce a stepped waveform, the step heights of which are a measure of the energies of the radiation quanta;

detecting the occurrences of steps in the stepped waveform; at each detected step occurrence, integrating the stepped waveform over a time period preceding the step occurrence to form a first integral value;

integrating the stepped waveform over an equal time period following the step occurrence to form a second integral value; and

subtracting the first integral value from the second integral value,

whereby the differences between the first and second integral values are a measure of the individual energies of the radiation quanta.

3,872,288
DUAL DISTANCE CALCULATING AND DISPLAY APPARATUS

Harry R. Sampey, Vanderbilt, Pa., assignor to Pentron Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 194,401, Nov. 1, 1971, abandoned. This application Mar. 15, 1973, Ser. No. 341,604

Int. Cl. H03k *21/00;* **G06f** *7/52*

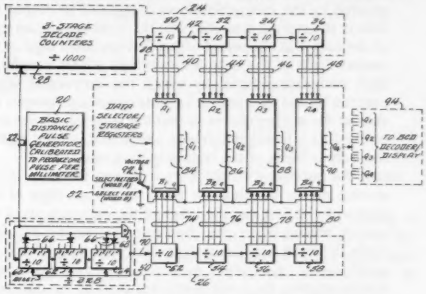
U.S. Cl. 235—151.32 **4 Claims**

1. A distance measuring device for simultaneously processing electrical distance pulses representing predetermined increments of measured distance in a plurality of processing circuits and to thereby produce a plurality of selectable outputs representing accumulated measured distance in terms of a desired selected unit of distance measure, said device comprising:

distance pulse generator means calibrated to produce said electrical distance pulses in a predetermined proportion to a measured distance,

first computation means connected to receive and process said distance pulses and to provide a first calculated digital output representing the accumulated measured distance in terms of a first predetermined unit of distance measure,

second computation means also connected to receive and process said distance pulses and to provide a second calculated digital output representing accumulated measured distance in terms of a second predetermined unit of



distance measure which differs from said first unit of measure by other than a factor of ten, and

selection means connected to receive the calculated digital outputs of both said first computation means and said second computation means for selectively providing a desired selected one calculated digital output representing accumulated measured distance in terms of one of said first predetermined unit of distance measure and said second predetermined unit of distance measure, and

decoding and display means connected to receive said selected one calculated digital output and to decode and visually display said selected output.

3,872,289
DEVICE FOR FEEDING OUT DATA WITH CLASSIFYING FUNCTION

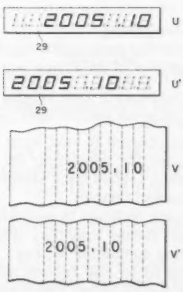
Tsuyoshi Kawanabe, Yokohama, and Minoru Machida, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1973, Ser. No. 360,588

Claims priority, application Japan, May 22, 1972, 47-51094

Int. Cl. G06k *15/00*

U.S. Cl. 235—152 **6 Claims**



1. An output device for a calculator for classifying and feeding out data comprising:

a key board including data entry keys and instruction keys for entering instruction entry signals;

operating means for executing an operation in accordance with the data entered by the entry keys and the instruction entered by the instruction keys;

data storing means for storing the data entered by the entry keys and operational result produced by the operating means;

output means having a predetermined number of output positions for feeding out the data in the storing means;

discriminator means for discriminating a most significant digit designating signal by which the instruction signal entered by the instruction keys designates to output the data in the storing means so that the most significant digit of the data is in alignment with a first specified digit of the output digits of the output means and a least significant digit designating signal by which the instruction signal entered by the instruction keys designates to output the data in the storing means so that the least significant digit of the data is in alignment with a second specified digit of the output digits of the output means; and

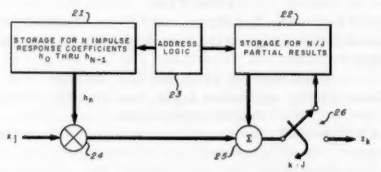
means for supplying to the output means the data in the storing means aligning the most significant digit of the data with the first specified digit of the output digits of the output means when the discriminator means discriminates the most significant digit designating signal and for supplying to the output means the data in the storing means aligning the least significant digit of the data with the second specified digit of the output digits of the output means when the discriminator means discriminates the least significant digit designating signal.

3,872,290

FINITE IMPULSE RESPONSE DIGITAL FILTER WITH REDUCED STORAGE

Arthur W. Crooke, Concord, and Paul H. Schottler, Acton, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 24, 1973, Ser. No. 400,078
Int. Cl. G06f *15/34*
U.S. Cl. 235—152 **6 Claims**



1. A digital filter comprising

input means for receiving input digital signals representative of sequential samples of an analog waveform to be filtered,

first storage means for storing digital samples of the impulse response of said filter,

convolution means coupled to said input means and said first storage means for computing the discrete partial convolution of each current input sample with respect to said impulse response samples,

second storage means included in said convolution means for simultaneously storing a plurality of the results of said partial convolution computations, and

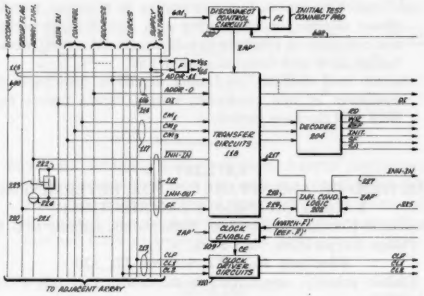
output means coupled to said second storage means for providing output digital signals representative of those of said plurality of partial convolution results completed by inclusion of a current input sample, thereby providing said output digital signals representative of said filtered analog waveform.

3,872,291

FIELD REPAIRABLE MEMORY SUBSYSTEM

John Carpenter Hunter, II, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Mar. 26, 1974, Ser. No. 454,880
Int. Cl. G11c *29/00*; **G06f** *11/00*
U.S. Cl. 235—153 AK **8 Claims**



1. A repairable store having connected thereto, from an external source, means for transmitting an address signal, means for transmitting a data signal, means for transmitting control signals, means for transmitting a disconnect signal, and adapted to receive address and control signals from said external source and to transfer data signals to and from said external source, said store comprising a plurality of basic units of store, each one of said basic units comprising:

a bus portion including at least one address signal line, a data signal line, a control signal line, and a disconnect signal line, said bus portion interconnecting said plurality of basic units;

a first means for storing said data signals;

a second means for storing an address;

third means connected to said control signal line and responsive to one of said control signals for storing at least one status signal;

means responsive to said third storage means for selectively enabling said second storage means to store a unique address transmitted over said address signal line;

means for controlling the transfer of data signals between said data signal line and said first storage means;

first comparison means responsive to a comparison between address signals received over said at least one address signal line and said stored address for generating a match signal;

second comparison means responsive to said match signal and a different one of said control signals for actuating said controlling means;

second means for connecting said at least one address signal line to said first comparison means, for connecting said data signal line to said first storage means, and for connecting said control signal line to said third storage means and said second comparison means; and

means for disabling said second connecting means in response to said disconnect signal and said match signal to thereby disconnect said one basic unit of store from said signal bus.

3,872,292

SONIC MEANS FOR DETECTING COMPRESSOR STALL

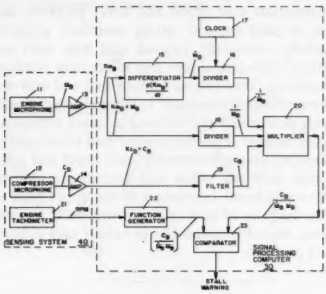
William H. Dawson, Jr., Waldwick, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 26, 1973, Ser. No. 382,806
Int. Cl. G06g *7/70*
U.S. Cl. 235—151.3 **14 Claims**

1. A condition detection system for rotating machinery comprising:

first and second sonic detectors located at discrete and separate locations on the machinery for generating respective first and second signals;

a speed detector for generating a third signal indicative of the rotational speed of the machinery; and

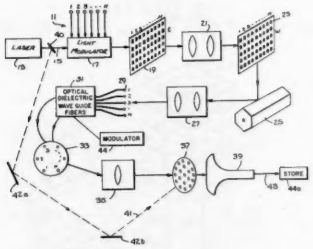


computer means connected to receive said first, second and third signals for producing an output signal indicative of the condition.

3,872,293
MULTI-DIMENSIONAL FOURIER TRANSFORM OPTICAL PROCESSOR

Eugene L. Green, New London, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 216,030, Jan. 7, 1972, abandoned. This application July 30, 1973, Ser. No. 384,151
Int. Cl. G06g *7/19, 9/00*
U.S. Cl. 235—181 **14 Claims**



1. A multi-dimensional optical processor for processing a time sequence of data signals from a two-dimensional input comprising:

means for converting said data signals to light signals by modulating the amplitude and phase of a beam of light with said data signals, thus forming a modulated light beam;

first optical means for performing an integral transform on the light signals of said modulated light beam, obtaining an output of said first optical means;

means for re-mapping the output of said first optical means, preserving optical phase and amplitude thereof, thus obtaining re-mapped signals;

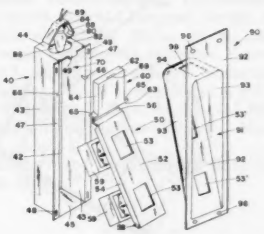
second optical means for integral transforming said re-mapped signals, obtaining an output of said second optical means; and

means for detecting coherently and storing the output of said second optical means.

3,872,294
HOSPITAL BED SERVICE UNIT WITH COMBINATION NIGHT LIGHT/SWITCH LIGHT ASSEMBLY

Patrick J. O'Toole, Wisconsin Rapids, Wis., assignor to Joerns Furniture Company, Stevens Point, Wis.

Filed July 30, 1973, Ser. No. 383,820
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 S **6 Claims**



1. In combination with a hospital service unit having a leading edge with a recess therein adapted for hanging on the wall of a hospital room proximate a hospital bed, a night light and switch light assembly mounted on said leading edge of said hospital service unit, said light assembly comprising:

a housing including a plurality of wall members including a top, bottom, and a back wall defining an open front enclosure, said housing being mounted vertically along its length within said recess in said service unit;

a switch panel mounted in said housing, said panel being recessed behind said leading edge of said unit, one end of said panel being fixed to said back wall a distance spaced from said top wall of said housing, the other end of said panel being fixed to said bottom wall at said open front of said housing such that said panel is angularly disposed in said housing;

a cover for said open front, said cover extending downwardly from said top wall a distance generally corresponding to the distance between said one end of said panel and said top wall, said cover, said back wall, and said top wall defining a chamber in said housing having an opening which opens downwardly along said panel and through said open front of said housing;

lighting means in said chamber, said lighting means directing light through said opening in said chamber and over said switch panel to illuminate same and downwardly to provide night lighting for the hospital room; and

at least one switch means mounted on said recessed panel for controlling the operation of lights or other technical facilities on said unit, said switch means being located completely behind said leading edge of said unit for protection thereby and illuminatiaon by said lighting means.

3,872,295
APPARATUS FOR INSPECTING CONFINED AREAS ADJACENT THE FLOOR

William B. Clancy, 5606 Rolling Ridge Dr. East, San Antonio, Tex. 78228

Continuation-in-part of Ser. No. 336,232, Feb. 27, 1973, Pat. No. 3,816,738. This application May 3, 1974, Ser. No. 466,532
Int. Cl. F21l *1/00*
U.S. Cl. 240—2.18 **5 Claims**

1. An apparatus for inspecting confined areas adjacent the floor comprising:

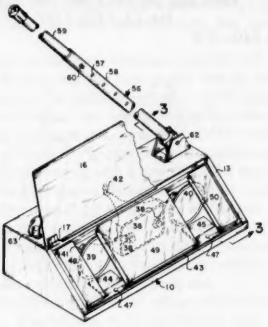
a. an outer case having a first end and a second end,

b. a floor plate comprising the lower extremity of said outer case,

c. multiple casters recessed in said floor plate, said casters adapted to roll along a surface supporting said floor plate adjacent the surface,

d. a tiltable mirror means flexibly supported at substantially a 45° angle on said floor plate,

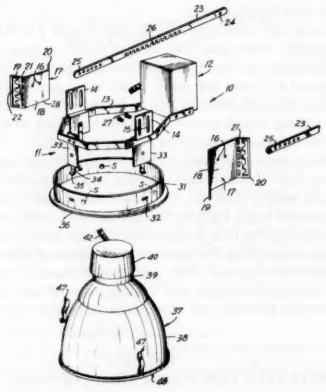
e. a tilt linkage secured to said mirror means adapted to tilt said mirror means responsive to a tensioning or releasing of tension of said tilt linkage,



f. a rotatible control handle mounted on said outer case, and

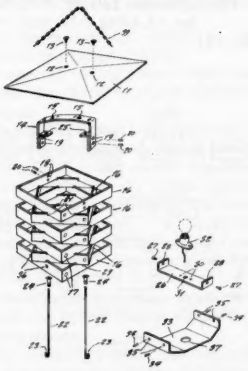
g. a tilt windlass attached to said control handle and to said tilt linkage, said tilt windlass tensioning or relaxing tension of said tilt linkage responsible to rotate said control handle.

3,872,296
RECESSED LIGHTING FIXTURE
Alain Cohen, and Orfelio Lalli, both of Montreal, Canada, assignors to Lightolier Incorporated, Jersey City, N.J.
Filed Apr. 18, 1974, Ser. No. 461,934
Int. Cl. F21s *1/02, 1/06, 3/06*
U.S. Cl. 240—73 BC **4 Claims**



1. A lighting fixture for a hung ceiling installation comprising a frame adapted to be mounted above the ceiling, a cylindrical bezel releasably secured to said frame, said bezel having an annular upper shoulder portion disposed above the level of the ceiling and having a lower circular flange adapted to underlie the lower surface of said ceiling, a frusto-conic, downwardly open reflector assembly releasably secured to said bezel, said reflector assembly having a depending open mouth portion, an annular rim formed on said reflector assembly surrounding said mouth portion, the outer peripheral surface of said rim fitting slidably and intimately within said bezel, stop means extending interiorly of said bezel, said stop means being disposed in the path of the upper edge of said rim to limit upward movement of said reflector assembly relative to said bezel, and a plurality of angularly spaced apart, generally vertically directed support spring members mounted on said reflector for releasably connecting said reflector to said bezel, said support spring members including a lower mounting portion secured to said reflector adjacent said rim, an upper, free end portion engaging an exterior wall of said reflector in upwardly spaced relation to said rim, a detent portion intermediate said upper and lower portions, said detent portion of said support spring members projecting a distance radially outwardly beyond said rim, said support spring members including upper and lower cam portions disposed, respectively, between said upper end and said detents, and between said detents and said lower ends, said upper cam portions being positioned and inclined to coact with said bezel to deflect said detents inwardly toward said reflector responsive to upward relative movement of said bezel and reflector, said lower cam portions, when said detents are shifted to a position above said bezel, coacting with the upper edge of said bezel to urge said rim of said reflector upwardly against said stop positions, thereby releasably to retain said reflector in said installed position.

3,872,297
PATIO LITE
Raleigh E. Rohlof, R.R. No. 2, Hicksville, Ohio 43526
Filed Oct. 11, 1973, Ser. No. 405,691
Int. Cl. F21p *5/00*
U.S. Cl. 240—78 E **1 Claim**



1. In a patio light, the combination of a vertical stack of frames forming a side of a lamp, a lamp bulb centrally positioned within said stack radiating light rays, and a canopy lid over said stack, said lamp including a chain securable to an upper end thereof so to hang said lamp, and said lamp including a bottom bracket for supporting said lamp upon a pole, said lamp including a top bracket to hold said lid and stack of frames together by means of a pair of rods, each said frame being of square shape, each alternate frame being positioned having side walls vertically aligned and corners vertically aligned, and each frame between said alternate frames being horizontally obliquely turned respective thereto, light emanating apertures accordingly being formed between said vertically aligned alternate side walls.

3,872,298

HERBICIDAL OXADIAZOLIDINEDIONES

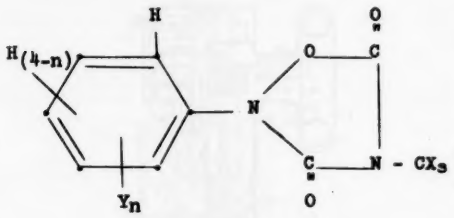
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 23, 1968, Ser. No. 707,402

Int. Cl. C07d 85/52

U.S. Cl. 260—307 B 6 Claims

1. A compound of the formula



wherein X is halogen; Y is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl, halogen, lower alkoxy, nitro, lower alkylthio, lower alkylsulfoxide and lower alkylsulfone; and n is an integer from 0 to 4 provided a maximum of two Y's are selected from the group consisting of nitro when n is greater than 2.

3,872,299

PROCESS AND DEVICE FOR DEFLECTION OF A RADIATION BEAM

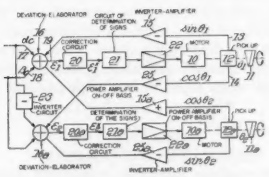
Patrick Marie Nicolas, Le Chesnay, France, assignor to Republic of France, represented by the Minister of State for National Defense Delegation Ministerielle pour l'Armement, DPAG-Bureau des Brevets et Inventions, Paris, France

Filed Nov. 6, 1973, Ser. No. 413,364

Claims priority, application France, Nov. 30, 1972, 72.42520

Int. Cl. G01j 1/20

U.S. Cl. 250—203 10 Claims



1. A process for deflection of a radiation beam allowing the bringing of the deflected path of the beam into a reference direction defined by its coordinates α_C and β_C along two perpendicular directions, using two beam deflector members which move as a unit causing an angular displacement of the deflected beam about a predetermined direction perpendicular to the directions of the coordinates and whose displacement in the reverse direction and at the same speed causes a displacement of the deflected beam about the said predetermined direction or from the said predetermined direction, comprising the steps of: determining the deflected path at a given moment as defined by its coordinates α_M and β_M along the said directions of coordinates, determining the sign of a first magnitude $\alpha_C+\beta_C-(\alpha_M+\beta_M)$ and of a second magnitude $(\beta_C-\alpha_C)-(\beta_M-\alpha_M)$, moving a first deflector organ in a first direction when the first magnitude is positive and in the opposite direction when the said first magnitude is negative, and moving a second deflector organ in the said first direction when the said first magnitude is positive and in the opposite direction when the said second magnitude is negative.

3,872,300

OPTOELECTRONIC DEVICE

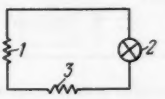
Alexandr Yakovlevich Vul, prospekt Proveschenia, 104, kv. 192; Alexandr Yakovlevich Shik, Torzhkovskaya ulitsa, 2, korpus 2, kv.34, both of Leningrad; Natalia Alexandrovna Dobryakova, ulitsa Karla Marxa, 34/30, Leningradskaya oblast; Ibragim Ibragimovich Saidashev, Yakovskaya ulitsa, 8, kv. 115, and Jury Vasilievich Shmartsev, prospekt Toreza, 9, kv. 1, both of Leningrad, all of U.S.S.R.

Filed Mar. 1, 1974, Ser. No. 447,391

Claims priority, application U.S.S.R., Mar. 3, 1973, 1895849

Int. Cl. G01j 1/32; G02f 1/28; H01j 39/12

U.S. Cl. 250—205 4 Claims



1. An optoelectronic device comprising a photoconductor provided with two leads and made from low-resistance n-type semiconductor material with high-resistance inclusions forming n^+n junctions at the boundaries thereof, and an emitter also provided with two leads, one being connected to one of the leads of said photoconductor and the other being connected to the second lead of said photoconductor.

3,872,301

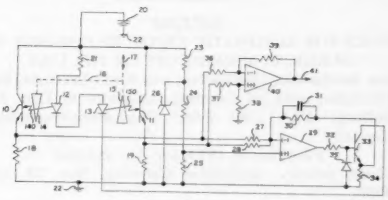
AUTOMATICALLY TEMPERATURE-COMPENSATED ELECTRO-OPTIC CIRCUIT

Mandred Joppich, Munich, Germany, assignor to Fritz Schwarzer GmbH, Munich, Germany

Filed Mar. 15, 1974, Ser. No. 451,611

Int. Cl. G01j 1/32; G01d 5/34

U.S. Cl. 250—205 11 Claims

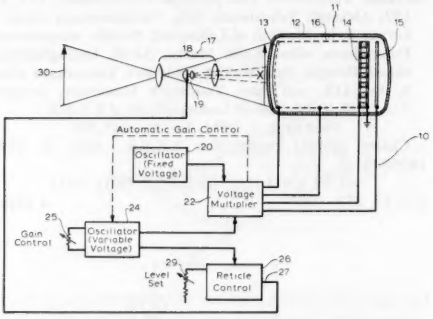


1. An electro-optic circuit for automatically temperature compensating parameter variations in said circuit resulting from ambient temperature variations, said electro-optic circuit comprising a power supply, electro-optic means for generating at least two signals, means for sensing said parameter variations by obtaining the sum and difference of said signals, means utilizing said sum of said signals for automatically controlling said generating means to maintain said signals approximately constant, and output means for utilizing said difference of said signals.

3,872,302
IMAGE INTENSIFIER SYSTEM WITH RETICLE BRIGHTNESS CONTROL

Ferdinand G. Fender, Glenview, Ill., assignor to Ni-Tec, Skokie, Ill.

Filed Mar. 20, 1974, Ser. No. 452,801
Int. Cl. G01j *1/32;* **H01j** *31/50*
U.S. Cl. 250—213 **12 Claims**



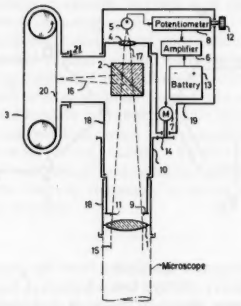
1. An image intensifier system comprising:
a cathode structure responsive to impinging radiant-energy images to develop corresponding electron images;
reticle generating means for projecting a reticle image of radiant-energy onto said cathode structure;
display means for converting said electron images to visible images;
amplifying means including a variable gain control for amplifying said electron images by a selectable gain and for focusing said amplified electron images onto said display means;
gain sensing means for sensing the gain of said amplifying means and for developing a reticle image intensity control signal having a magnitude inversely related to the gain of said amplifying means; and
means coupling said gain sensing means to said reticle generating means for applying said reticle image intensity control signal to said reticle generating means; whereby as the gain of said amplifying means varies, said reticle image intensity control signal regulates the intensity of said reticle image to maintain at said display means a visible reticle notwithstanding variations in the gain of said amplifying means.

3,872,303
DEVICE FOR AUTOMATIC EXPOSURE CONTROL IN A SURGICAL MICROSCOPE OR THE LIKE

Heinz Jakubowski, Oberkochen, and Klaus Leutwein, Essen-Heisingen, both of Germany, assignors to Carl Zeiss-Stiftung, d/b/a Carl Zeiss, Oberkochen/Wurttemberg, Germany

Filed Nov. 9, 1973, Ser. No. 414,534
Claims priority, application Germany, Nov. 18, 1972, 424988
Int. Cl. H01j *39/12*
U.S. Cl. 250—214 P **6 Claims**

1. A self-contained unit-handling automatic-diaphragm connecting-piece assembly for selective interposition between a surgical microscope equipment and a continuously viewing camera, said assembly comprising a housing having separate means at each of two spaced openings for separable connection to such an equipment and to a selected camera body, one of said openings being on a first axis of equipment-attachment and the other of said openings being on a second axis of camera-body attachment, image-forming means mounted in said housing on said first axis, optical means including a beam-splitter mounted in said housing and so oriented with respect to said image-forming means that light entering said housing via said image-forming means is divided in part to said second axis and is further divided along a third axis, photoelectric-detector means carried by said housing and positioned for response to light directed along said third axis, amplifier means connected for response to the output of said detector means, a motor connected to drive in response to the output

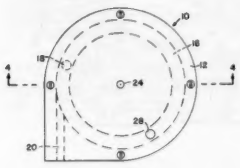


of said amplifier means, and a variable diaphragm carried by said housing on said first axis and coupled to said motor for varying the setting thereof, whereby exposure at an attached camera body is automatically regulated independent of camera body and for a span of field brightness as presented by an optical equipment attached at said one opening.

3,872,304
FLUID FLOW MEASURING SENSOR

Little J. Little, and Joseph A. Oddo, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 25, 1974, Ser. No. 436,558
Int. Cl. G01d *5/34*
U.S. Cl. 250—231 R **1 Claim**

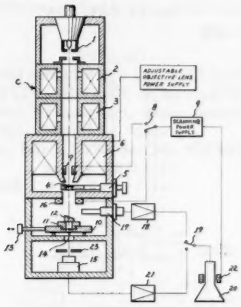


1. A fluid flow measuring sensor comprising a housing
a circular track formed in said housing,
an inlet passageway in said housing entering said track tangentially adjacent the outer wall of said track,
a slit extending completely around the inner wall of said track and communicating with a discharge passageway in said housing,
a ball in said circular track,
means for detecting movement of said ball around said circular track,
said movement detecting means comprises a light source in said housing adjacent said circular track, and
a photo sensing device in said housing adjacent said circular track and opposite said light source.

3,872,305
CONVERTIBLE SCANNING ELECTRON MICROSCOPE

Hirotami Koike, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1973, Ser. No. 419,262
Claims priority, application Japan, Dec. 6, 1972, 47-140160
Int. Cl. H01j 37/26
U.S. Cl. 250—311 3 Claims



1. A convertible scanning electron microscope comprising an evacuated chamber surrounding an electron optical axis, an electron beam generating source at one end of the optical axis, a focusing lens along the axis, an objective lens following the focusing lens along the axis, a first specimen holder stage arranged to hold a transmission specimen within the objective lens, a second specimen holder stage arranged to hold a specimen spaced beyond the objective lens along the axis, a deflection system comprising a deflection means disposed along the axis between the focusing and objective lenses and a means for detecting and displaying signals detected and converting them into a scanning electron image of either the transmitted electrons from the transmission specimen or the emitted electrons from the secondary electron specimen, the said objective lens having an excitation power supply adjustable to provide an adjustable focal length such that the electron beam can be focused on the transmission specimen or alternately on the secondary electron specimen such that in a transmission scanning mode, the focusing lens and objective lens focus the electron beam upon the specimen, and the objective lens also serves as a first image forming lens, and such that in a secondary electron scanning mode, the focusing lens and objective lens serve to focus the electron beam upon the sample.

3,872,306
SEPARATING APPARATUS

John Palmer, Midlothian, Scotland, assignor to National Research Development Corporation, London, England

Filed Apr. 13, 1973, Ser. No. 350,963
Claims priority, application United Kingdom, Apr. 19, 1972, 18127/72
Int. Cl. H01j 39/12; G06m 7/00
U.S. Cl. 250—312 11 Claims

1. Apparatus for separating a mixture of bodies of different materials into at least two categories of materials, comprising: means for supplying a mixture of bodies of different materials at a variable rate of supply;

control means for controlling the rate of supply of the said mixture;

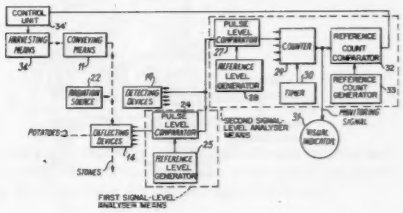
a source of ionizing radiation arranged to produce a laterally spread beam or array of beams of radiation;

an array of radiation detecting devices positioned to receive radiation from said course;

a conveyor belt for passing said mixture of bodies in a laterally spread formation between the radiation source and said array of detecting devices;

first signal-level analyzer means adapted to analyze the output signal levels of said detecting devices for distinguishing bodies of one category from bodies of another category in dependence upon the degree of attenuation of said ionizing radiation by the different materials of the bodies;

an array of deflecting devices adapted to pass bodies of different materials in different directions under the control of said first analyzer means; and

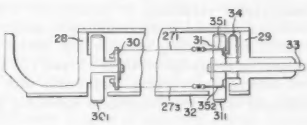


second signal-level analyzer means connected to the outputs of said detecting devices for producing a throughput monitoring signal by combining the signal responses of said detecting devices resulting from attenuation of radiation by all bodies in the mixture, the output of said second analyzer means being connected to said control means to control said rate of supply of the mixture in dependence upon said throughput monitoring signal.

3,872,307
DISCHARGER FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS

Kuichi Miyamoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1973, Ser. No. 332,573
Claims priority, application Japan, Feb. 21, 1972, 47-21264
Int. Cl. H01j 37/00
U.S. Cl. 250—324 3 Claims

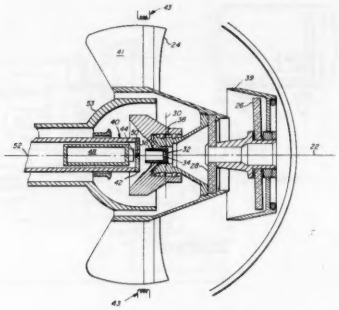


1. A discharger for use with an electrophotographic copying apparatus comprising a plurality of discharge wires, means for interchanging said discharge wires with one another for discharging, terminal receivers for holding said discharge wires, a shield member surrounding said discharge wires on three sides thereof, at least one side portion of said shield member being secured to the body of the said copying apparatus and the remaining portion of the discharger being removable with respect to the body of said copying apparatus.

3,872,308
OPTICAL SYSTEM FOR RETICLE-TYPE INFRARED SEEKER

James E. Hopson, Wellesley, and Gordon C. MacKenzie, North Billerica, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sept. 28, 1973, Ser. No. 401,748
Int. Cl. G02b 5/14
U.S. Cl. 250—347 5 Claims

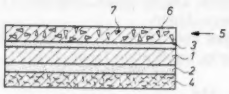


2. The optical arrangement recited in claim 1 wherein the dispersing means includes a light pipe.

3,872,309
RADIOGRAPHIC INTENSIFYING SCREENS

Maurice Hector De Belder, Mechelen; Romain Henri Bollen, Hove, and Robert Florent Van Esch, Mechelen, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Nov. 3, 1972, Ser. No. 303,388
Claims priority, application United Kingdom, Dec. 31, 1971, 61050/71
Int. Cl. H01j 1/62
U.S. Cl. 250—483 26 Claims



1. A radiographic intensifying screen combination suited for use in radiographic recording of information with a silver halide recording material, said combination comprising (1) a metallic substrate including at least one metal having an atomic number in the range of 46 to 83, and (2) at least one fluorescent substrate in working relationship with said metal and including at least one fluorescent substance having the formula:

$$M_{(w-n)} \cdot M'_nO_wX$$

wherein:

M is at least one of the metals selected from the group consisting of yttrium, lanthanum, gadolinium and lutetium,

M′ is at least one of the rare earth metals selected from the group consisting of hysprosium, erbium, europium, holmium, neodymium, praseodymium, samarium, terbium, thulium and ytterbium,

X is selected from the group consisting of sulphur and halogen,

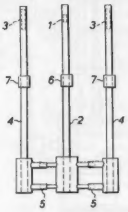
n is 0.0002 to 0.2, and

w is 1 when X is halogen and 2 when X is sulphur.

3,872,310
DETECTION OF CORROSION BY A RADIOMETRIC TECHNIQUE

John Stuart Charlton, and John Francis Ross, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 13, 1973, Ser. No. 332,114
Claims priority, application United Kingdom, Feb. 17, 1972, 7426/72
Int. Cl. G01t 1/16
U.S. Cl. 250—358 1 Claim

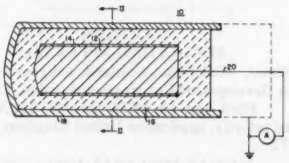


1. A method for the in situ monitoring or detection of corrosion in tubes which in use are subjected to a corrosive medium, by assessing the thickness of one or more tube walls in a bundle which consists of at least two parallel tubes, said method comprising emitting a radioactive emission from a plurality of tubes in a bundle in turn, detecting the emission in each of the immediately adjacent tubes, thereby measuring the absorption of radiation in each such adjacent tube, and comparing the measurement with a standard measurement representing a known thickness of the material of which the tubes are made wherein the degree of corrosion of each tube is indicated on a diagram illustrating the configuration of the bundle by markings which correspond to the amount of absorption measured.

3,872,311
SELF-POWERED NEUTRON DETECTOR

Norman P. Goldstein, Delmont, Pa., and William H. Todt, Elmira Heights, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 5, 1973, Ser. No. 376,848
Int. Cl. G01t 3/00
U.S. Cl. 250—390 5 Claims



1. In a self-powered neutron detector which comprises a radiation absorptive emitter core comprised of a material of high neutron cross section that spontaneously emits radiation upon capturing neutrons, which emitted radiation includes high average energy prompt electrons produced by emitted gamma ray interactions and delayed beta radiation emitted by decay of the activation product;

an insulating material encompassing the emitter core, and an outer conductive sheath about the insulating material, which outer conductive sheath is of a material which produces little radiation upon exposure to neutrons, an electrical lead-in connected to the emitter core, which lead-in is brought through the insulating material

whereby the lead-in and the outer conductive sheath can be electrically connected to electron current measuring means;

the improvement wherein a thin conductive layer of low neutron cross-section and high density material is disposed substantially about the emitter core, which high density material is absorptive of the beta radiation emitted by decay of the emitter core activation product, but is substantially transmissive to the high average energy prompt electrons emitted by the emitter core.

3,872,312

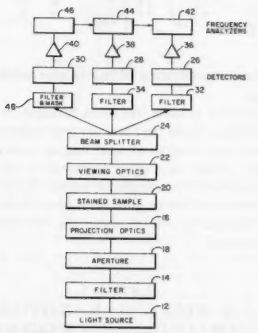
METHOD AND APPARATUS FOR DETECTING AND CLASSIFYING NUCLEIC ACID PARTICLES

Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed July 2, 1973, Ser. No. 375,807

Int. Cl. G01t *1/16*

U.S. Cl. 250—458 **25 Claims**



1. Apparatus for detecting and classifying, in a fluid specimen, submicron-dimensioned particles containing a nucleic acid and stained with a fluorescent dye specific to said nucleic acid, said apparatus comprising,

a radiation source for providing illumination within an excitation band of said dye,

means for directing said illumination into said specimen,

means for viewing fluorescence emission produced from said dye responsively to said illumination, and

means for spatially filtering at least one of said illumination and said fluorescence emission so as to provide intensity modulation of said emission due to Brownian motion of said particles.

3,872,313

OZONE GENERATOR

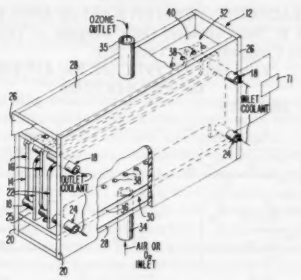
Willard F. Emigh, El Dorado Hills, and Rudi Beichel, Sacramento, both of Calif., assignors to Aerojet General Corporation, El Monte, Calif.

Filed Mar. 13, 1974, Ser. No. 450,698

Int. Cl. C01b *13/12*

U.S. Cl. 250—541 **23 Claims**

23. An ozone generator comprising: a housing; a plurality of reactor plates, each plate having a plurality of fluid passages therethrough and a coating of ceramic material covering the entire outer surface thereof to define a dielectric therefor; means mounting said reactor plates within said housing and in interleaved, spaced relationship with respect to each other with the mounting means dividing the reactor plates into two groups, said mounting means including a pair of tubular mounts for each group of reactor plates, respectively, the reactor plates being cantilevered relative to respective mounts, at least one of the mounts of each group being electrically conductive and in electrical contact with the corresponding reactor plates, said mounts being in fluid communication with the passages of corresponding reactor plates; and a refrigeration system in fluid communication with said mounts and having a refrigerant for cooling said reactor plates, the latter defining the evaporator for said refrigeration system.



3,872,314

ELECTROLUMINESCENT DEVICES AND APPARATUS INCLUDING SUCH DEVICES

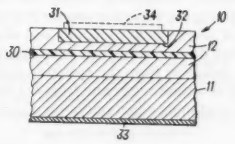
Anthony Ralph Peaker, Saddleworth, and Anthony Mottram, Romiley, both of England, assignors to Ferranti Limited, Hollinwood, Lancashire, England

Filed Jan. 16, 1974, Ser. No. 433,792

Claims priority, application United Kingdom, Jan. 18, 1973, 2703/73

Int. Cl. G02f *1/28;* **H01l** *11/00, 15/00*

U.S. Cl. 250—552 **21 Claims**



1. An electroluminescent device with a P-N junction capable of emitting electromagnetic radiation with a negative resistance characteristic comprising a body having on a suitable substrate an epitaxially deposited layer of a III-V compound semiconductor, within the layer there being provided a region of one conductivity type and a region of the opposite conductivity type with the P-N junction therebetween, the region of said one conductivity type has a current impeding portion with a small concentration of less than 5×10^{15} free charge carriers per $cm.^3$, the current impeding portion is at least two diffusion lengths of minority charge carriers away from the P-N junction, and the device also includes contact means, the arrangement being such that when an electrical potential greater than a predetermined value is applied to the contact means the P-N junction is biassed and emits electromagnetic radiation, there being a current path through the device with the current impeding portion wholly across the current path, the radiation emitted by the P-N junction causing a reduction in the current impeding action of the portion to an extent greater than the reduction caused by minority charge carrier interaction between the portion and the P-N junction, and because of the reduction in the current impeding action of the portion the P-N junction continuing to emit electromagnetic radiation so long as the magnitude of the

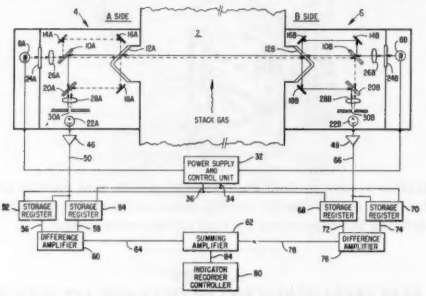
applied electrical potential is above a threshold value lower than the predetermined value.

3,872,315

RADIATION SENSITIVE FLUID ANALYZER

Richard H. Boll, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Dec. 21, 1973, Ser. No. 427,108
Int. Cl. G01n *21/26*
U.S. Cl. 250—575 **9 Claims**



1. In an analyzer for determining a characteristic of a fluid, in combination, a pair of symetrical transmitter-receiver units each comprising a housing, a radiation source disposed within said housing, an opening in one wall of said housing, a window closing said opening and forming a cavity having transparent walls through which radiation from the source is transmitted through the fluid to the other of the units, a phototransducer disposed within the housing, means diverting radiation from the source through the window to the phototransducer without passing through the fluid between said units, and means directing radiation received through the fluid from the other of said units through said window to said phototrandsucer, the combination further comprising means for alternately and cyclically energizing the radiation source in each of said units to cause each of said units to cyclically and alternately act as a transmitter and then as a receiver whereby the phototransducer receives radiation from the radiation source in the unit when operating as a transmitter and from the radiation source in the other of said units when operating as a receiver.

3,872,316

ENGINE AUTOMATIC CONTROL SYSTEM FOR VEHICLES INCLUDING PLURAL CLUTCH ACTUATED SWITCHES

Masaaki Kurii; Kyoshi Kobari, and Osamu Yanagi, all of Kasugai, Japan, assignors to Nippondenso Co., Ltd. Kariya-shi; Toyota Jidosha Hanbai Kabushiki Kaisha Nagaya-shi and Kabushiki Kaisha Tokai Rika Denki SeisakuSho, Azo, Shimootai all of Aichi-ken, Japan

Filed May 14, 1974, Ser. No. 469,786
Claims priority, application Japan, May 24, 1973, 48-61255
Int. Cl. H02p *9/04*
U.S. Cl. 290—38 **9 Claims**

1. An automatic control system for an internal combustion engine of a vehicle comprising:

an engine control circuit for controlling the operative condition of the engine in accordance with the driving condition of the vehicle;

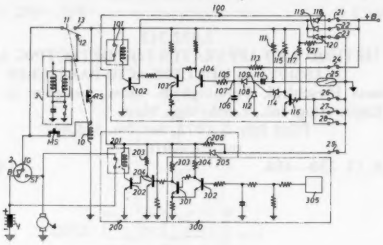
a starter energizing circuit for selectively connecting an electric source with a starter for the engine;

a starter cut-off circuit able to respond to the start of rotation of the engine caused by the starter to cut off current supply to the starter;

a first responsive means coupled with said engine control circuit to be actuated by the initial depression of a clutch pedal of the vehicle to cause the half engagement of clutch means of the vehicle so as to activate said engine control circuit and complete the operative condition of the engine;

a second responsive means coupled with said starter energizing circuit to be actuated by the final depression of the clutch pedal to cause the full disengagement of the clutch means so as to activate said starter energizing circuit; and

a third responsive means coupled with said engine control circuit for detecting the moving of the vehicle to maintain



the operative condition of the engine while the vehicle is moving;

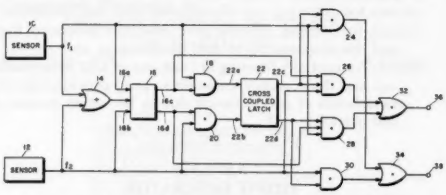
whereby when the vehicle has been brought to rest, the inoperative condition of said first and second responsive means act to cause the deactivation of said engine control circuit and automatically render the engine inoperative and the actuation of said first and second responsive means act to automatically rotate the starter of the engine by means of the activation of said starter energizing circuit under the full disengagement of the clutch means.

3,872,317

MEANS FOR SELECTING AN ADAPTIVE BRAKING SYSTEM CONTROLLING SPEED SIGNAL

Steven H. Peterson; Ralph W. Carp, and Harold E. Weissler, all of Newport News, Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 2, 1974, Ser. No. 457,317
Int. Cl. B60t *8/08*
U.S. Cl. 307—10 R **9 Claims**



1. An adaptive braking system for a wheeled vehicle comprising:

means for generating a first signal comprised of a train of pulses having a repetition frequency proportional to the speed of a first vehicle wheel;

means for generating a second signal comprised of a train of pulses having a repetition frequency proportional to the speed of a second vehicle wheel;

at least one output terminal;

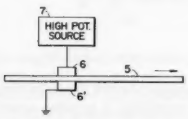
latch means having first and second states for generating at said output terminal an output signal having a repetition frequency equal to the repetition frequency of a predetermined one of said first and second signals when in said first state and for generating at said output terminal an output signal having a repetition frequency equal to the repetition frequency of the other of said first and second signals when in said second state, said latch means being

responsive to a predetermined sequence of consecutive pulses of said first and second trains to latch in said first state and responsive to a second predetermined sequence of consecutive pulses of said first and second signals to latch in said second state.

3,872,318
PYROELECTRIC ELEMENT OF POLYMER FILM

Naohiro Murayama, Iwaki, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 242,448, April 10, 1972, Pat. No. 3,794,986. This application Oct. 30, 1973, Ser. No. 411,122
Claims priority, application Japan, Apr. 8, 1971, 46-21374; Apr. 27, 1971, 46-27159
Int. Cl. G11c *13/02*
U.S. Cl. 307—88 ET **6 Claims**

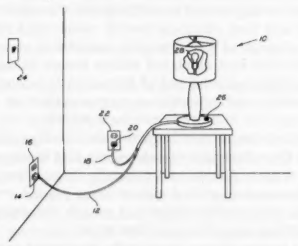


1. A process of storing signals in a pyroelectric element comprising a polymer film, which can be convered into a pyroelectric substance, having a stable non-uniform distribution of pyroelectricity along the surface of said polymer film and reproducing said signals stored in the element, which comprises generating stable polarization signals of different pyroelectricities in different local portions of the pyroelectric element and then delivering the polarization signals thus stored from the pyroelectric element as a consequence of the polarization change caused by a temperature change without eliminating the stored signals.

3,872,319
LAZY-MAN TYPE SWITCHING CIRCUIT

George E. Platzer, Jr., 31881 Staman Ct., Farmington Hills, Mich. 48024

Filed July 31, 1972, Ser. No. 276,539
Int. Cl. H01h *31/10*
U.S. Cl. 307—114 **15 Claims**

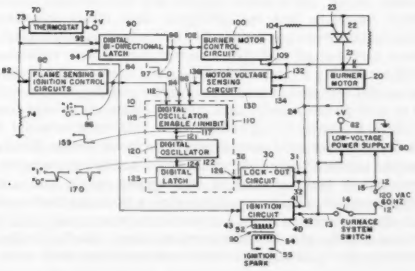


1. A remotely energizable electric lamp assembly for use in combination with a source of electrical potential in circuit with at least first and second duplex-type outlet assemblies spaced from each other, wherein said first duplex-type outlet assembly comprises at least first and second spaced outlets, wherein said second duplex-type outlet assembly comprises at least third and fourth spaced outlets, wherein at least said first outlet is in series circuit with a switch member situated electrically between said first outlet and said source, and wherein at least one of said third and fourth outlets is in a continuously closed circuit with said source, said lamp assembly comprising an electric bulb having two effective conditions one of which is an energized state and the other of which is a de-energized state, power conductor means electrically connected to said electrical bulb and adapted for electrical connection to said one of said third and fourth outlets or to said second outlet if only said first outlet of said first outlet assembly is in series circuit with said switch member, said power conductor means including switching means for at times completing an electrical circuit therethrough to said electrical bulb so as to thereby place said electrical bulb in said energized state, control means for at times causing said switching means to complete said electrical circuit through said power conductor means to said bulb and at other times causing said switching means to open said electrical circuit through said power conductor means to thereby place said electrical bulb in said de-energized state, said control means comprising control conductor means adapted for electrical connection to said first outlet of said first outlet assembly or to the other of said third and fourth outlets of said second outlet assembly if only said one of said third and fourth outlets is in a continuously closed circuit with said source, and energizable actuating means being effective whenever an electrical circuit has been completed through said switch member for causing said switching means to be switched so as to thereby change the state of said electrical bulb from a then existing one of said two effective conditions to the other of said two effective conditions and manually controlled switch means in circuit with said source and having at least two operating positions, said manually controlled switch means being effective when actuated from one of said at least two operating positions to another of said at least two operating positions to cause the state of said bulb to be changed from an existing one of said two effective conditions to another of said two effective conditions regardless of whether said circuit through said switch member is electrically open or closed, said switch means comprising at least one thyristor, said energizable actuating means comprising gating circuitry, and said manually controlled switch means being in circuit with said source and said gating circuitry.

3,872,320
FURNACE CONTROL CIRCUIT

Joseph A. Juskewicz, Jr., Grand Rapids, Mich., assignor to Lear Siegler, Inc., Holland, Mich.

Filed Sept. 12, 1973, Ser. No. 396,545
Int. Cl. F23n *5/00*
U.S. Cl. 307—117 **10 Claims**



1. For use in a furnace installation including a burner and a source of electrical power, a furnace control system comprising:

fuel supplying means selectively coupled to said source of electrical power for supplying fuel to said burner;

selectively actuated ignition means associated with said burner for igniting fuel therefrom;

first means coupled to said fuel supplying means for detecting when said supplying means is actuated to supply fuel to said burner;

second means positioned in proximity to said burner for detecting a flame;

means for generating a temperature command signal for actuating said fuel supplying means and said ignition means for actuating the furnace;

a control circuit coupled to said first and second detecting means and to said generating means for providing a control signal in response to predetermined detected conditions indicating the existence of a failure condition including loss of power to said fuel supplying means; and

a lockout circuit coupled from said fuel supplying means and said ignition means to said source of electrical power and further coupled to said control circuit and responsive to control signals from said control circuit to deactuate said fuel supplying means and said ignition means in the event a failure is detected.

3,872,321

INVERTER CIRCUIT EMPLOYING FIELD EFFECT TRANSISTORS

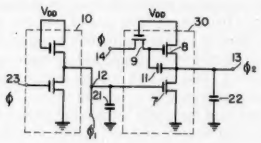
Shigeki Matsue, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Sept. 21, 1973, Ser. No. 399,541

Claims priority, application Japan, Sept. 25, 1972, 47-95966

Int. Cl. H03k *19/08, 19/40, 23/24*

U.S. Cl. 307—205 **4 Claims**



1. A circuit arrangement comprising a first inverter circuit having an input terminal and an output terminal, a second inverter circuit having an input terminal connected to the output terminal of said first inverter circuit, a control terminal and an output terminal, means coupled to said output terminal of said first inverter circuit for delaying the output of said first inverter circuit, and a power supply, said first inverter circuit further having a first insulated-gate field effect transistor connected between one terminal of said power supply and said output terminal of said first inverter, and a first switching transistor having a control electrode and connected between said output terminal of said first inverter and the other terminal of said power supply, said control electrode of said first switching transistor being connected to said input terminal of said first inverter, said second inverter circuir further having a second insulated-gate field effect transistor being connected between said one terminal of said power supply and said output terminal of said second inverter, a third insulated-gate field effect transistor being connected between said control terminal and the gate of said second insulated-gate field effect transistor, the gate of said third insulated-gate field effect transistor being connected to said one terminal of said power supply, a second switching transistor having a control electrode and connected between said output terminal of said second inverter and said other terminal of said power supply, said control electrode of said second switching transistor being connected to said input terminal of said second inverter circuit, and a first capacitor connected between said output terminal of said second inverter circuit and the gate of said second insulated-gate field effect transistor.

3,872,322

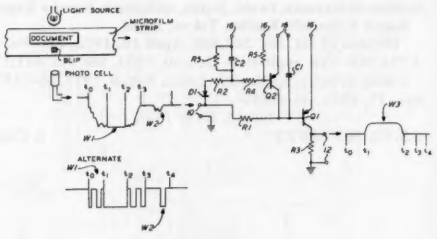
DISCRIMINATOR CIRCUIT

Hans Weigert, Woodcliff Lake, N.J., assignor to Ragen Semiconductor, Inc., Whippany, N.J.

Filed Jan. 30, 1974, Ser. No. 437,973

Int. Cl. H03k *5/20, 17/26*

U.S. Cl. 307—231 **8 Claims**



1. A discriminator circuit for receiving an irregular waveform and for providing a regular waveform, said irregular waveform potentially having false transitions during a first predetermined period of time immediately following the beginning of said waveform, having a substantially regular portion during a second predetermined period of time immediately following said first predetermined period of time, and potentially having false transitions during a third predetermined period of time immediately following said second predetermined period of time and immediately preceding the end of said irregular waveform, and said irregular waveform potentially followed by a spurious waveform during a fourth predetermined period of time immediately following the end of said irregular waveform, comprising:

an input for receiving said irregular waveform;

an output for providing said regular waveform;

first electrical switch means electrically associated with said output and for being connected to a source of potential and said first electrical switch means having a first state and a second state and normally in said first state, upon said first electrical switch means being placed in said second state said first electrical switch means connecting said source of potential to said output and upon said first electrical switch means being placed in said second state said first electrical switch means disconnecting said source of potential from said output, the presence of said potential at said output providing said regular waveform;

a first timing circuit electrically associated with said input and said first electrical switch means and responsive to the receipt of said irregular waveform at said input to place said first electrical switch means in said first state at substantially the end of first said predetermined period whereby said potential is not provided at said output during said first predetermined period;

second electrical switch means electrically associated with said first electrical switch means and having a first state and a second state and normally in said first state, upon said second electrical switch being placed in said second state said second electrical switch returning said first electrical switch to said first state;

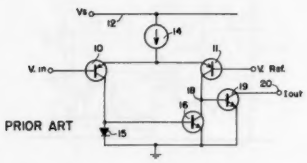
second timing means electrically associated with said input and said second electrical switch means and for placing said second electrical switch in said second state at substantially the beginning of said third period; and

third timing means electrically associated with said second electrical switch means and for maintaining said second switch means in said second state during said third and said fourth predetermined periods whereby said potential is disconnected from said output during said third and fourth predetermined periods.

3,872,323
DIFFERENTIAL TO SINGLE ENDED CONVERTER CIRCUIT

Thomas M. Frederiksen, San Jose, and Don William Zobel, Santa Clara, both of Calif., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 20, 1972, Ser. No. 219,462
Int. Cl. H03k *5/153*; **H03f** *3/14, 3/18*
U.S. Cl. 307—235 R **8 Claims**



1. A differential to single ended converter circuit for coupling to first and second signal current paths in which differentially related signal currents flow, and providing output signal current therefrom, including in combination

semiconductor means including a single base electrode, a single emitter electrode, and first and second collector electrodes, said semiconductor means forming a single multi-collector transistor,

first circuit means connecting said first collector electrode to said base electrode at a junction,

second circuit means connecting said junction and said emitter electrode in the first signal current path,

third circuit means connecting said second collector electrode and said emitter electrode in the second signal current path, and

output circuit means connected to said third circuit means for providing output signal current related to the signal currents in the first and second current paths.

3,872,324
LOGIC SYSTEM FOR SEQUENTIALLY TESTING THE STATES OF A SYSTEM OF CONTACTS

Poland Nahon, Paris, France, assignor to Jeumont-Schneider, Paris (Seine), France

Continuation of Ser. No. 300,328, Oct. 24, 1972, abandoned. This application June 14, 1974, Ser. No. 479,475
Claims priority, application France, Oct. 21, 1971, 71.37793
Int. Cl. H03k *17/00*; **G01r** *31/02*
U.S. Cl. 307—241 **1 Claim**

1. A logic circuit for testing the states of an array of contacts comprising:

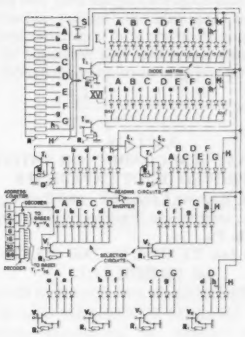
a. 2^{n+p} contacts to be tested, n and p being integers greater than 1, the contacts being tested by groups of 2^m, m being an integer less than n;

b. a diode matrix comprising 2^n columns and 2^p rows wherein each diode is in series with one of the contacts to be tested, each column is connected to one of a plurality of 2^n bus bars, each bus bar having one end connected via a load resistance to one pole of a battery whose other pole is grounded, and each row is grounded via row switching means;

c. 2^m reading circuits each comprising a diode logic or-circuit having 2^{n-m} inputs and a single output, each of the 2^n bus bars being connected to only one of said reading circuit inputs the output of each logic or-circuit being connected to the base of a reading transistor said reading transistor connected to an amplifier for detecting whether the reading transistor is in the conductive or non-conductive state, each such state corresponding to one of the positions of the tested contact;

d. an address counter having 2^{n+p-m} addresses; and

e. decoding means connected to said address counter and comprising selector circuits having diode logic or-circuit elements, said elements having outputs grounded via a

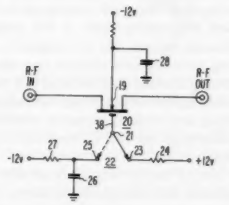


selecting transistor and inputs connected to said bus bars, said decoding means grounding every input but one of each of said reading circuits and said decoding means triggering only one of said row switching means into a conducting state.

3,872,325
R-F SWITCHING CIRCUIT

Melvin Edward Adams, Pennsauken, and Rubin Feryszka, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 17, 1973, Ser. No. 407,183
Int. Cl. H03k *17/60*
U.S. Cl. 307—251 **10 Claims**



1. In an electronic switching system comprising a source of at least one radio-frequency signal, utilization means for at least a portion of said radio-frequency signal, an insulated-gate field effect transistor with source and drain electrodes and a transmission channel of variable conductivity therebetween and with a gate electrode for controlling the conductivity of its transmission channel, said field-effect transistor having a source-to-drain capacitance and having a gate-to-channel capacitance including gate-to-source capacitance and gate-to-drain capacitance components thereof, means for selectably coupling said source of radio-frequency signal and said utilization means in loop including said transmission channel, means for selectably applying a first or a second potential level to said gate electrode, said first potential level being of a polarity with respect to said radio-frequency signal as applied with respect to said transmission channel to render

said transmission channel relatively conductive when applied to said gate electrode, said second potential level being of a polarity with respect to said radio-frequency signal as applied to said transmission channel to render said transmission channel relatively non-conductive when applied to said gate electrode, the improvement wherein said means for selectably applying a first or a second potential level applies said first potential level to said gate electrode at an impedance level higher for said radio-frequency signal than that presented by its gate-to-channel capacitance and applies said second potential level to said gate electrode at an impedance level lower for said radio-frequency signal than that presented by each of its said gate-to-source and gate-to-drain capacitances.

3,872,326

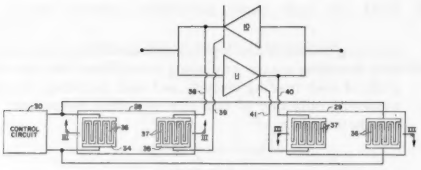
BIDIRECTIONAL SEMICONDUCTOR SWITCH WITH IMPROVED DV/DT CAPABILITY

Surinder Krishna, Ballston Lake, N.Y., and Paul R. Malmberg, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 23, 1974, Ser. No. 435,820

Int. Cl. H03k *17/72*

U.S. Cl. 307—252 T **3 Claims**



1. A bidirectional semiconductor switch comprising:

A. two thyristors electrically connected in reverse parallel and disposed in at least one semiconductor body having first and second opposed major surfaces, (1) each said thyristor having four impurity regions of alternate carrier-type disposed alternately with a PN junction formed between adjacent regions, the two impurity regions intermediate being base regions and the two extremity impurity regions being emitter regions, and (2) metal electrical contacts spaced apart on the major surfaces of said semiconductor body and making separate ohmic contact with the two emitter regions and at least one base region of each thyristor;

B. a blocking circuit comprising at least one acoustic surface wave device for electrically isolating the thyristors from each other and from a control circuit generating control signals for the thyristors, each surface wave device comprising (1) a base member capable of propagating a surface wave and electrically insulating electrical input signals from electrical output signals, (2) at least one transmitter transducer having a grid with interdigital fingers supported on said base member and adapted to receive an electrical control signal and generate an acoustic surface wave in said base member in response to said electrical control signal, and (3) at least one receiver transducer having a grid with interdigital fingers deposited on said base member and adapted to receive an acoustic surface wave transmitted in said base member by a transmitter transducer and produce an electrical output signal in response to said acoustic surface wave; and

'. electrical means for separately conducting control signals from said surface wave device to the metal contacts connected to emitter and base regions of each thyristor.

3,872,327

DRIVE CIRCUIT FOR PULSE WIDTH MODULATED D.C. - D.C. CONVERTORS

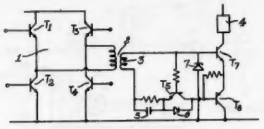
Bernhardt Siegfried Rudert, Sandton, and John Trafford Rowe Freeman, Roodepoort, both of South Africa, assignors to Inpel (Proprietary) Limited, Johannesburg, South Africa

Filed Oct. 11, 1973, Ser. No. 405,560

Claims priority, application South Africa, Oct. 16, 1972, 72/7334

Int. Cl. H03k *17/60*

U.S. Cl. 307—300 **6 Claims**



1. A method of operating a power output transistor which method comprises interrupting the emitter current of said transistor simultaneously with the base drive current and immediately thereafter allowing the collector current, due to stored charge in the base collector junction, to flow through the base and thence through a low source impedance during extraction of the said stored charge.

3,872,328

CIRCUIT ARRANGEMENT HAVING A PLURALITY OF TOUCH CONTACTS

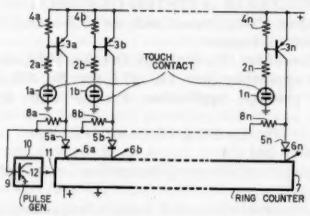
Cornelis Jozef Hulsbosch, and Tjeerd Pieter van der Zee, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,678

Claims priority, application Netherlands, Aug. 25, 1972, 7211592

Int. Cl. H03k *27/00;* **H03j** *1/00*

U.S. Cl. 307—308 **6 Claims**

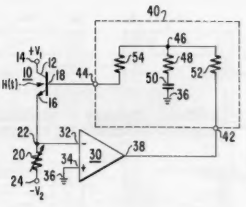


1. A circuit arrangement having a plurality of touch contacts, and outputs corresponding thereto, in which in response to an instantaneous operation of one of the contacts the output corresponding thereto continously assumes an operating condition and the other outputs assume a rest condition, said circuit arrangement comprising a ring counter having outputs constituting of said outputs of the circuit arrangement, characterized by a number of gates which are each controlled by one of the contact and the corresponding output of the ring counter and are able to supply a gateoutput signal if the contact connected thereto is operated and the ring counter output connected thereto is in the rest condition, and means controlled by said gates for applying counting pulses to the ring counter if and as long as one of the said gates supplies the said gate-output signal.

3,872,329
RADIATION SENSING CIRCUIT

George Bertram Dodson, III, Shirley, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1974, Ser. No. 448,826
Int. Cl. H03k 3/42; G01j 1/32
U.S. Cl. 307—311 10 Claims



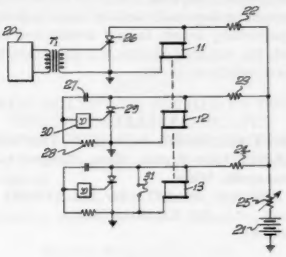
1. In combination:
a circuit node;
a radiation sensor having a control terminal to which a control signal may be applied for adjusting the radiation sensitivity of said sensor and having also an output current path connected to said node for supplying an output current thereto, said output current being proportional to the intensity of radiation applied to said sensor at a given control signal level applied to said control terminal;
a second current path connected to said circuit node for withdrawing from said node a fixed current level, said second current path accepting the current supplied to said node by said output current path;
circuit means for supplying said control signal to said sensor and for maintaining said circuit node at a given virtual reference voltage level, said circuit means including means responsive to any tendency for the current level in said output current path to change, for changing the value of the control signal in a sense to return the flow of current in said output current path to its original value; and low pass filter means for initially receiving said control signal produced by said circuit means, attenuating said control signal and applying the attenuated control signal to said sensor, said low pass filter means having a first and a second, higher, break frequency and providing minimum attenuation of said control signal at frequencies below said first break frequency and a fixed maximum value of attenuation of said control signal at frequencies above said second break frequency.

3,872,330
HIGH POWER ACOUSTICAL TRANSDUCER WITH ELASTIC WAVE AMPLIFICATION

Darrow L. Miller, Los Angeles, and William Y. Wells, Torrance, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 25, 1973, Ser. No. 409,534
Int. Cl. H01v 7/00
U.S. Cl. 310—8 13 Claims

1. A method of producing sonic or ultrasonic waves from a number of piezoelectric elements acoustically coupled, said elements being polarized for expansion and contraction along the axis of soundwave transmission comprising the steps of
charging said elements simultaneously through a high impedance from a voltage source,
discharging said elements in sequence, each element being discharged through a low impedance path, and
timing the discharge of each succeeding element after the first element has been discharged by detecting the sonic energy induced voltage produced in each element by the elastic wave progressing through said element and triggering a switch to discharge the element in which the induced voltage is detected whereby the discharge occurs

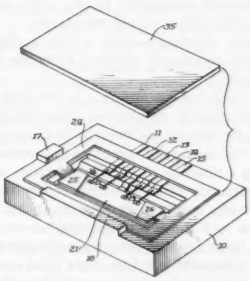


in phase sequence with the elastic wave passing through it from the preceding element.

3,872,331
PACKAGED SURFACE WAVE SELECTIVE CIRCUIT DEVICE AND METHOD OF MAKING THE SAME

Guy N. Falco, Schaumburg, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 4, 1973, Ser. No. 366,811
Int. Cl. H01r 7/00
U.S. Cl. 310—9.4 6 Claims



4. A surface wave selective circuit device adapted for electrical and mechanical interfacing with associated circuit devices comprising:
a recessed ceramic container having a plurality of printed electrically conductive patterns including a ground plane on the bottom of the recess and conductive terminals extending from the recess along a predetermined surface of said ceramic container;
at least two distinctive reference locations located on said ceramic container providing measurement reference points for positioning a surface wave device within the recess;
a surface wave selective device, having input and output transducer terminals on an operational surface of a substrate of piezo-electric material, conductively bonded within said recess in a position providing clearance for said operational surface with the walls of said recess and with said opposed major surface electrically connected to said ground plane;
means for electrically connecting said input and output transducer terminals to said conductive terminals;
a preformed gasket in contact with said ceramic container and aligned with respect to said distinctive reference locations said gasket having inwardly extending dampening elements contacting the respective end regions of said

operational surface of said selective device to provide controlled dampening of surface waves; and

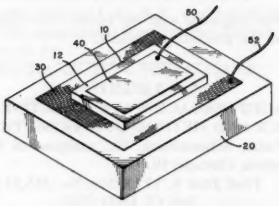
a ceramic cover plate in contact with said preformed gasket and sealed to said ceramic container to overlie said recess without contacting said surface wave selective device while permitting access to said conductive terminals to establish the required electrical connection to said surface wave selection device.

3,872,332

COMPOSITE BOND FOR ACOUSTIC TRANSDUCERS

Charles D. Butter, Eden Prairie, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 19, 1971, Ser. No. 135,287
Int. Cl. H01v *7/00*
U.S. Cl. 310—9.7 **2 Claims**



1. An acoustic device comprising:

a piezoelectric transducer having a first and a second surface and a first acoustic impedance,

an acoustic medium having a third surface and a second acoustic impedance different from the first acoustic impedance,

first electrode means attached to the first surface, a sheet-like electrically conductive metal mesh positioned between the second and third surfaces and forming a second electrode means, the electrically conductive metal mesh having a plurality of openings therein, and,

a polymerizable plastic material filling the openings of the electrically conductive metal mesh and adhering to the second and third surfaces, the electrically conductive metal mesh and the polymerizable plastic material forming a composite bond having a third acoustic impedance essentially equal to the square root of the first and second acoustic impedances, the third acoustic impedance being determined by the impedance of the electrically conductive metal mesh, the impedance of the polymerizable plastic material, and the percentage of open space in the electrically conductive metal mesh.

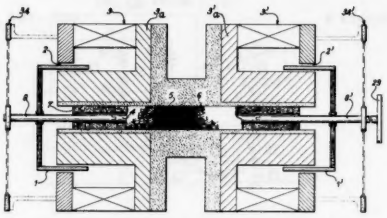
3,872,333

GENERATOR FOR PRODUCING RECTILINEAR VIBRATIONS AT A CONTROLLED VELOCITY ESPECIALLY FOR USE IN MOSSBAUER SPECTROMETERY

Pierre Imbert, Bures-Sur-Yvette, and Jean-Francois Lericque, Val-D'Albian, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Feb. 28, 1973, Ser. No. 336,825
Claims priority, application France, Mar. 8, 1972, 72.07977
Int. Cl. H02k *33/12*
U.S. Cl. 310—27 **3 Claims**

1. A generator for producing rectilinear vibrations at a controlled velocity, of the type comprising a driving unit formed by a stationary permanent magnet and by a driving electromagnetic coil which moves within the airgap of said magnet, a rod rigidly fixed to said coil and a transducer for detecting the velocity of said rod and regulating the vibrations by electronic control, said transducer being constituted by a magnetized pin placed within a stationary double solenoid having reverse windings and carried by a stationary body and one end of said pin being attached to said rod, wherein said generator essentially comprises a second rod attached to the other end of said magnetized pin and a second driving unit in



which the polarity of the magnet is opposite to that of the first in order to permit pushpull operation therewith, said second rod and said second driving unit being mounted symmetrically with the first with respect to the central transverse section of said magnetized pin and said velocity transducer being fitted within said two driving units.

3,872,334

INTEGRAL ROTOR AND GEAR ASSEMBLY

Robert J. Loubier, 3111 Covington Rd., Fort Wayne, Ind. 46704

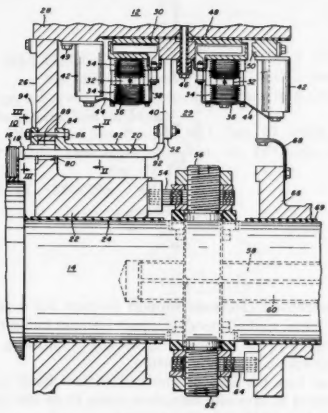
Division of Ser. No. 244,130, April 14, 1972, Pat. No. 3,842,148. This application Apr. 18, 1974, Ser. No. 461,904
Int. Cl. H02k *7/10*
U.S. Cl. 310—43 **10 Claims**

1. For use in a dynamoelectric machine, an integral rotor assembly comprising a permanently magnetized rotor and a force-transmitting element formed of the same material, said material including a solidified mixture of thermoplastic and magnetic particles capable of being permanently magnetized, said magnetic particles in said rotor being oriented according to a predetermined magnetic field pattern, said thermoplastic serving as a holding matrix for said particles and also providing structural strength for said assembly, said particles being homogeneously distributed throughout said assembly except as modified by said orientation, the quantity of said particles in said assembly being sufficient to provide said rotor with a predetermined magnetic strength with said particles oriented as aforesaid, and the quantity of said thermoplastic in said assembly being sufficient to provide a predetermined structural strength for said assembly, said structural strength being of a magnitude as provides for the transmission of motive force by said force-transmitting element to or from said rotor.

3,872,335
ROTATING RECTIFIER ASSEMBLY FOR BRUSHLESS EXCITERS

Sigrud R. Petersen, Irwin; Sui-Chun Ying, Monroeville, and August C. Mann, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1974, Ser. No. 448,859
Int. Cl. H02r *11/00*
U.S. Cl. 310—68 D **9 Claims**

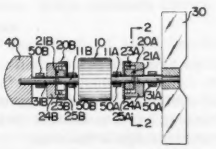


1. In a brushless excitation system including an alternating current exciter and a rotating rectifier assembly having a rectifier wheel supported for rotation with the exciter, said wheel having a radial web portion and a rim portion, rectifier means mounted on the rim portion of the wheel, a plurality of leads extending radially from the exciter and passing through openings in the web portion of the wheel for connection to said rectifier means, and means for supporting said leads comprising an elastic tubular member attached to the web portion of the wheel in position to encircle the leads, said tubular member extending axially over the leads and engaging the leads to support them in the radial direction.

3,872,336
FLECTRIC APPLIANCE WITH HAIR DRYER AND SHAVER

Jeunn-Wen Lin, 18-3 Lani 29 Chin Hsuch St., Tainan, and Go-Sing Lin, 4 Tzu-Hao, Hsing-shu Rd., Kaohsung Hsien, both of China

Filed Jan. 24, 1974, Ser. No. 436,196
Int. Cl. H02k *7/14*
U.S. Cl. 310—78 **7 Claims**

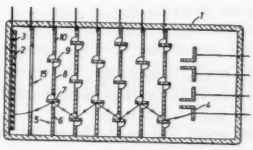


1. In combination, a shaver and hair dryer, comprising: a motor having axial, rotatable shaft means; hair dryer fan means selectively connectible with said shaft means for rotation therewith to dry hair; shaver blade means selectively connectible with said shaft means for rotation therewith to shave hair; transmission means connected between said hair dryer fan means and the shaft means and between the shaver blade means and the shaft means to alternately selectively engage and disengage said fan means and said shaft means and then said shaver blade means and shaft means; and means operatively associated with said transmission means to operate said transmission means.

3,872,337
ELECTRON MULTIPLIER FORMED BY TWISTING FINGERS IN PARALLEL PLATES

Gordon Peter Davis, Sunbury-on-Thames, and John Wardley, Hounslow, both of England, assignors to EMI Limited, Middlesex, England

Filed Feb. 21, 1974, Ser. No. 444,370
Claims priority, application United Kingdom, Feb. 27, 1973, 9747/73
Int. Cl. H01j *43/20, 39/04*
U.S. Cl. 313—95 **5 Claims**

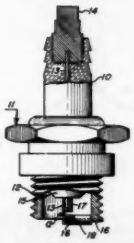


1. An electron multiplier having a hermetically sealed envelope, a plurality of secondary electron emissive multiplying electrodes in said envelope, said electrodes comprising a plurality of parallel conductive plates arranged one behind the other and slit to form fingers in the planes of said plates with alternate fingers being twisted out of the planes of the plates perpendicular thereto, the twisted fingers in successive plates being staggered to form separate zigzag electron multiplying channels.

3,872,338
SPARK PLUG

Bernard Wax, 38 Highland Ave., Succasunna, N.J. 07876

Filed July 23, 1973, Ser. No. 381,758
Int. Cl. H01t *13/20, 13/46*
U.S. Cl. 313—130 **2 Claims**



1. A spark plug comprising,
a. a core of insulating material carried by a metal shell,
b. a main electrode carried by said core,
c. a ground electrode connected to said shell and having an end portion spaced from an end portion of the main electrode
d. a non-conducting ceramic material covering the said end portion of the ground electrode, and

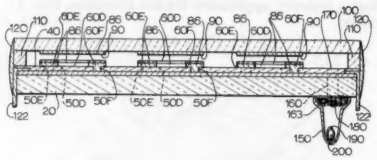
e. a non-conducting ceramic material covering the said end portion of the main electrode and spaced from the covering on the end portion of the ground electrode.

3,872,339

MULTI-POSITION CHARACTER DISPLAY PANEL

Thomas C. Maloney, Bernardsville, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 3, 1972, Ser. No. 294,535
Int. Cl. H01j *61/28*
U.S. Cl. 313—188 **6 Claims**



1. A display device comprising
a gas-filled panel-like envelope including a base plate and a face plate spaced therefrom,
at least one anode and one cathode electrode within said envelope,
a hole in said base plate for permitting gas to leave and enter said envelope,
a tubulation secured to said base plate and enclosing said hole,
a mass of mercury in said tubulation, and
a mass of fibrous material in said tubulation and positioned to block said hole,
said mass permitting the flow of gas and mercury vapor into said envelope through said hole, but preventing the entry of relatively large globules of mercury through said hole into said envelope.

3,872,340

HIGH TEMPERATURE LAMP STARTING AID

Byron R. Collins, Twinsburg, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed May 28, 1974, Ser. No. 473,743
Int. Cl. H01j *65/00*
U.S. Cl. 313—198 **9 Claims**

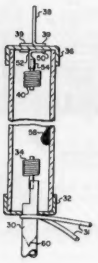
1. A high pressure metal vapor lamp comprising:
a tubular light-transmitting envelope having thermionic electrodes sealed into its ends and containing a charge of vaporizable metal and inert starting gas;
and a capacitive starting aid comprising a thermally deformable metal member electrically connected to one electrode, said member having an end disposed to lie against the envelope at room temperature in order to facilitate starting by capacitive effect, and adapted to move away from said arc tube when heated by the operation of said lamp.

3,872,341

ELECTRODE SUPPORT ELEMENT FOR CERAMIC DISCHARGE LAMP

Leo C. Werner, Cedar Grove, N.J.; Francis C. M. Lin, Flushing, N.Y., and William J. Knochel, West Orange, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 4, 1974, Ser. No. 447,618
Int. Cl. H01j *17/04*
U.S. Cl. 313—217 **7 Claims**



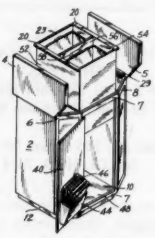
4. An improved electrode support element for a ceramic discharge lamp, said electrode support element being formed from a single strip of refractory metal and comprising:
an intermediate flat blade portion;
a pair of foot portions at one end of said blade portion extending in opposite directions away from and at right angles to said blade portion; and
a semi-tubular electrode gripping portion at the other end of said blade portion extending linearly therewith.

3,872,342

CABINET

Carolyn H. Dankert, 11 Muller Ave., Highland Falls, N.Y. 10928

Continuation-in-part of Ser. No. 200,939, Nov. 22, 1971, abandoned. This application May 1, 1972, Ser. No. 249,266
Int. Cl. A47b *81/02*
U.S. Cl. 312—290 **3 Claims**



1. A cabinet of the type used in a kitchen comprising:
a. a substantially hollow housing;
b. storage means within said housing comprising a generally rectangular housing and a removable rectangular receptacle within said rectangular housing;
c. said receptacle comprises a plurality of compartments, said receptacle having handle means for removing said receptacle from said housing;
d. a top wall comprising at least two top members each pivotally secured to said housing, with at least one of said members having opened and closed positions such that with said one member in said open position, said top wall is thereby partially removed exposing said storage means

to provide access to the top of said housing into said storage means, and with said one member in said closed position there is provided, from one of said members to the other of said members, a continuous and uninterrupted work surface; and

e. shelves lying parallel to said top wall, affixed to said housing, and spaced below said top wall such that with one of said members in said open position, at least one of said shelves is accessible to said top, said receptacle has flange means for engaging said shelves, said shelves support said receptacle.

3,872,343

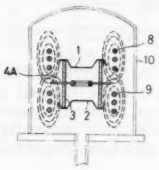
MULTIPLE-ELECTRODE DISCHARGE TUBE AND METHOD OF MANUFACTURING SAME

Shigeru Furuta, Tokyo, Japan, assignor to Kabushiki Kaisha Sankosha, Tokyo, Japan

Division of Ser. No. 211,917, Dec. 27, 1971, Pat. No. 3,771,205. This application Apr. 13, 1973, Ser. No. 351,170

Int. Cl. H01j *1/46, 21/10*

U.S. Cl. 313—296 **2 Claims**



1. A multiple electrode discharge tube comprising:

a cylindrical glass envelope having a substantially uniform outer diameter;

at least one first disc-shaped electrode member positioned to extend through said envelope at a position intermediate the opposite ends of said envelope;

a plurality of second disc-shaped electrode members positioned to extend through said envelope at positions on opposite sides of said at least one first electrode member; each of said at least one first electrode members having a thickness and a diameter greater than the thickness and diameter of each of said plurality of second electrode members;

the outer edges of each of said first and second electrode members extending externally of the outer surface of said envelope and forming connecting terminals; and

said envelope being fused and rigidly secured to said electrode members at the portions thereof extending through said envelope.

3,872,344

IMAGE PICKUP TUBE

Kazuo Shimizu, and Okio Yoshida, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 15, 1972, Ser. No. 289,278

Int. Cl. H01j *31/26*

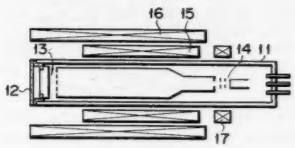
U.S. Cl. 313—386 **14 Claims**

1. An image pickup tube comprising a vacuum envelope containing an electron gun, a target disposed on the front of the envelope and a signal pickup electrode, said target having an effective scanning region which is scanned by the electron beam emitted by said electron gun;

the improvement wherein:

said target comprises a first photo-conductive layer made of cadmium selenide disposed on the inner surface of the faceplate of said envelope, a second layer disposed on said first photo-conductive layer, a high resistivity layer disposed on said second layer and a transparent electrically conductive layer disposed on the outer central surface of said first photo-conductive layer corresponding to said effective scanning region; an

said signal pickup electrode is located so as to reduce the residual image on said effective scanning region of said



target, said signal pickup electrode being disposed only on the edge portion of said target and not on said effective scanning region of said target, said signal pickup electrode surrounding said transparent conductive layer and being spaced from said transparent conductive layer.

3,872,345

COLOUR PICTURE TUBES

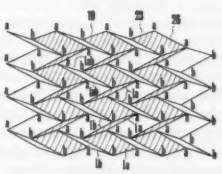
Eiichi Yamazaki, Ichihara, and Akio Yamaguchi, Mobara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 23, 1973, Ser. No. 408,938

Claims priority, application Japan, Oct. 27, 1972, 47-107203

Int. Cl. H01j *29/80*

U.S. Cl. 313—403 **7 Claims**



1. In a colour picture tube of the class comprising an evacuated envelope, a fluorescent screen disposed in said envelope, a colour selection electrode disposed to oppose said fluorescent screen and including an effective area provided with a plurality of perforations for transmitting electron beams, and an electron gun assembly, the improvement which comprises a compensating mechanism having a corrugated surface of contiguous concave-convex areas substantially constituting said effective area of said colour selection electrode for absorbing local thermal expansion of said effective area thereby preventing deformation of said effective area.

3,872,346

CHARACTER DISPLAY DISCHARGE TUBE

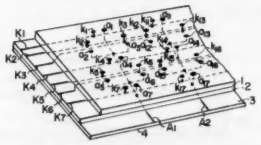
Takao Kunii, 10-9 Mukonaso-1-chome, Amagasaki, Japan

Filed July 17, 1973, Ser. No. 380,098

Claims priority, application Japan, July 20, 1972, 47-73206; Aug. 25, 1972, 47-85613

Int. Cl. H01j *7/42*

U.S. Cl. 313—514 **8 Claims**



5. A character display discharge device as defined by claim **4** wherein said multiplicity of second conductive bus bars are parallel to each other and perpendicular to said first conductive bus bar.

3,872,347

DEGAUSSING DEVICE FOR COLOUR CATHODE RAY TUBES

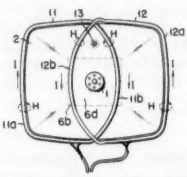
Yoshiichi Matsushima, Yokohama, and Toshiyuki Abe, Fukaya, Saitama, both of Japan, assignors to Tokyo Shibaura Electric Co., Kawasaki-shi, Japan

Filed Apr. 9, 1973, Ser. No. 349,637

Claims priority, application Japan, Apr. 14, 1972, 47-37556; Apr. 14, 1972, 47-37562; June 17, 1972, 47-60055

Int. Cl. H01f *13/00*

U.S. Cl. 315—8 **6 Claims**



1. A degaussing device for a colour television picture tube which comprises a generally funnel shaped envelope portion having a faceplate at one end thereof, said faceplate having outer side peripheral portions, and a neck section at the other end thereof, the axial direction of the picture tube being defined as a direction extending substantially centrally through the funnel shaped envelope portion from the neck section to the faceplate, and electron beam deflection means (**7**) provided around the outer periphery of the neck section of the picture tube, and having a forward end portion which is located closer to the faceplate than the remaining portions of the deflection means (**7**), comprising:

a frustum-shaped magnetic shield (**6**) received in the colour television picture tube and formed of a forward end portion (**6***a*) magnetically connected to a shadow mask disposed adjacent to the faceplate of the colour television picture tube, a rear end portion (**6***b*) set apart in the axial direction of the picture tube from the forward end portion of the electron beam deflection means (**7**) and an intermediate portion (**6***c*) extending substantially along an inner wall of the generally funnel shaped envelope portion of the television picture tube;

degaussing coil means (**11,12**) including a pair of outer coil portions (**11***a*,**12***a*) extending opposing each other along the outer side periphery of the faceplate and a pair of inner coil portions (**11***b*,**12***b*) extending opposing each other toward the neck section which passes between said inner coil portions, said inner coil portions (**11***b*,**12***b*) being on the outside of, and adjacent to, the funnel shaped envelope portion of said tube and said inner and outer coil portions being coupled with each other to form at least one loop, parts of the inner coil portions (**11***b*,**12***b*) being disposed substantially above the edge (**6***b*) of the rear opening of the magnetic shield (**6**) and being between the rear end portion (**6***b*) of the magnetic shield (**6**) and the forward endc portion (**6***a*) of the deflection means (**7**), said outer coil portions (**11***a*,**12***a*) being positioned near the forward end portion (**6***a*) of the magnetic shield (**6**) ; and

a degaussing current source (**14**) connected to the degaussing coil means (**11,12**) to supply at least one graduately attentuating alternating current to the degaussing coil means so as to produce current flow in the outer coil portions (**11***a*,**12***a*) in a predetermined direction relative to the tube and to produce current flow in the inner coil portions (**11***b*,**12***b*) in a direction opposite to said predetermined direction to thereby prodcuce degaussing flux flow which passes through both the magnetic shield and the shadow mask.

3,872,348

SPOT POSITIONING CONTROL FOR DISPLAY TUBES

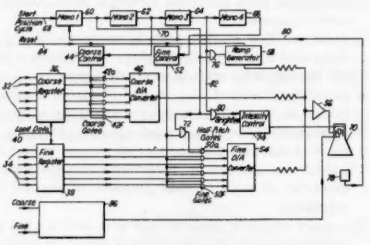
Edward T. Astley, London, England, assignor to Crosfield Electronics Limited, London, England

Filed June 18, 1973, Ser. No. 370,642

Claims priority, application United Kingdom, July 26, 1972, 34979/72

Int. Cl. H01j *29/70*

U.S. Cl. 315—27 R **17 Claims**



7. A light-spot positioning system in which a beam is angularly deflected to cause a light spot to traverse a grating of parallel lines, the system comprising:

beam-deflecting means for progressively deflecting a beam in a required direction to progressively displace the point of intersection of the beam with the grating;

first beam-positioning means for adjusting the beam position, in the said direction, by an amount such that the beam intersection with the grating moves through a fraction of a grating pitch;

second beam-positioning means for positioning the beam so as to displace its point of intersection with the grating in the desired direction through a distance equal to an integral multiple of the grating pitch;

detecting means for sensing the intersection of the beam with a grating line;

and sequencing means whereby initially the beam is positioned at least a predetermined fraction of the grating pitch from a grating line, by progressive deflection of the beam by the beam-deflecting means until the detecting means senses the intersection of the beam with an auxiliary line preceding the grating in the direction of travel of the beam and spaced therefrom by said predetermined fraction of the grating pitch, after which the second

beam-positioning means adjusts the beam position in the said direction by a predetermined integral multiple of the grating pitch, and thereafter the beam-deflecting means progressively deflects the beam until stopped by the action of the detector means on sensing the next intersection of the beam with a grating line.

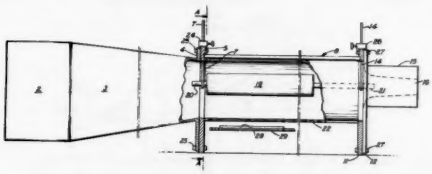
3,872,349
APPARATUS AND METHOD FOR GENERATING RADIATION

Donald M. Spero, Bethesda; Bernard J. Eastlund, Rockville, and Michael G. Ury, Bethesda, all of Md., assignors to Fusion Systems Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 239,149, March 29, 1973,. This application Aug. 22, 1973, Ser. No. 390,659

Int. Cl. H01j *7/46, 19/80*

U.S. Cl. 315—39 **25 Claims**



1. A microwave generated plasma light source for emitting a longitudinally extending sheet of light of arbitrary length comprising

means for generating microwave energy,

means for coupling said generated microwave energy to a discharge unit,

said discharge unit comprising a longitudinally extending non-resonant microwave chamber of an arbitrary length which encloses a sealed plasma-forming medium containing envelope which extends in said longitudinal direction in said chamber,

said chamber being comprised of a first longitudinally extending elliptically shaped reflecting member which is opaque to microwaves but is light reflective on its inside surface for reflecting light emitted by said envelope and a second longitudinally extending plane member joined to said elliptically shaped reflecting member along the bottom of said reflecting member to form said chamber,

said second member being substantially opaque to microwaves but substantially transparent to said emitted light, whereby light emitted along the entire length of said envelope is reflected as a sheet of light by said elliptical reflecting member through said transparent member and out of said chamber.

3,872,350
BALLAST HAVING INTEGRAL TIME DELAY RELAY

Walter F. Powell, Danville, and Charles Grimshaw, Fulton, both of Ill., assignors to General Electric Company

Filed Mar. 20, 1973, Ser. No. 342,993

Int. Cl. H05b *39/04*

U.S. Cl. 315—104 **6 Claims**

4. A ballast for starting and operating at least one gaseous discharge lamp having spaced apart electrodes; said ballast comprising:

an elongated casing at least partially filled with a potting material;

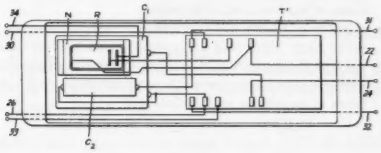
a transformer received in said casing, said transformer including a primary winding and a secondary winding inductively coupled therewith;

input circuit means for connecting said primary winding to a source of electric energy;

output circuit means for connecting at least said secondary winding to the at least one gaseous discharge lamp;

said transformer also including auxiliary windings inductively coupled to said primary winding for providing heating power for the electrodes;

a time delay relay received in said casing; said time delay relay including a heater electrically connected to one of said auxiliary windings for energization therefrom;



said time delay relay also including a switch connected in said output circuit means, said switch normally being open and moving to a closed condition upon a predetermined energization of said heater.

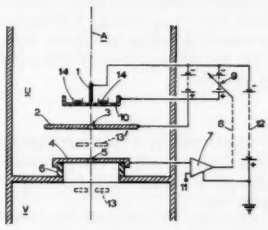
3,872,351
ELECTRON GUNS

Kenneth Charles Arthur Smith, 50 Selwyn Rd., Cambridge, and John Richard Adrian Cleaver, 27 Heath Rd., Potters Bar, Hertfordshire, both of England

Filed Apr. 24, 1973, Ser. No. 353,979

Int. Cl. H05b *39/04*

U.S. Cl. 315—107 **8 Claims**



1. A self-contained field emission electron beamforming gun assembly comprising a field emission cathode having a small-radius tip, an anode spaced from said cathode, said anode having a hole therethrough, means applying a positive electric potential to said anode with respect to said cathode whereby to cause the emergence of electrons from said tip, some of said electrons passing through said hole in the form of a beam, means for monitoring the quantity of said electrons passing through said hole, and correcting means responsive to said monitoring means, said correcting means determining the emission of electrons from said tip such as to keep said quantity of electrons passing through said hole substantially constant.

3,872,352
COLD CATHODE DISCHARGE DISPLAY APPARATUS

Rentaro Sasaki; Akinori Watanabe, both of Takasaki, and Tatsuo Ogasawara, Tokyo, all of Japan, assignors to Oki Electric Industry Co., Ltd. and Okaya Electric Industry Co., Ltd., both of Tokyo, Japan

Filed May 18, 1973, Ser. No. 361,423

Claims priority, application Japan, May 25, 1972, 47-051238

Int. Cl. H01j *29/70*

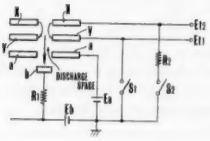
U.S. Cl. 315—169 R **6 Claims**

5. A cold cathode discharge display apparatus; a plurality of first electrodes;

second electrode having a plurality of perforations, each of which is arranged so as to substantially confront each of said first electrodes;

a plurality of third electrodes which are arranged in parallel to each other and are oriented in a first direction, each of those electrodes having a plurality of perforations substantially aligned with the corresponding said perforations of said second electrodes;

a plurality of fourth electrodes which are arranged in parallel to each other and are oriented in a second direction, each of those electrodes having a plurality of perforations substantially aligned with the corresponding said perforations of said third electrodes; and



a voltage detecting means to detect the voltage change between said third electrodes and said fourth electrodes; whereby when the voltage lower than firing voltage but higher than voltage for sustaining the discharge, is applied between said first and said second electrodes and at the same time said third and said fourth electrodes which are properly selected, are energized by an electrical signal, a proper pattern is formed in display while when the voltage lower than firing voltage but higher than the discharge sustaining voltage is applied between said third electrodes and said fourth electrodes, a pattern in display may be detected.

3,872,353

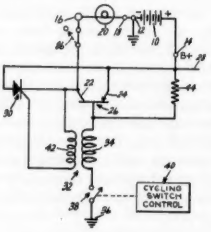
ELECTRONIC FLASHER CIRCUIT

Gerald D. Smith, and Frank R. Owens, both of Indianapolis, Ind., assignors to Carson Manufacturing Company, Inc., Indianapolis, Ind.

Filed Oct. 10, 1973, Ser. No. 404,996

Int. Cl. H05b *37/00*

U.S. Cl. 315—200 A **14 Claims**



1. A circuit for use in an electronic flasher comprising first and second normally non-conductive semiconductor switching devices each having a control element and two current-conducting elements, said current-conducting elements being coupled in shunt, two flasher-lamp electrodes and two power supply electrodes series connected with said current-conducting elements of one of said switching devices, and means for applying periodic switching potentials simultaneously to both said control elements for rendering both said switching devices conductive, said first switching device having a faster response time to the application of said switching potentials than said second switching device whereby said first switching device is rendered conductive in advance of said second switching device, said first switching device requiring a predetermined potential difference across its current-conducting elements to maintain its conductive state whereby a lesser potential difference thereacross occurring in response to said second switching device becoming conductive renders said first switching device non-conductive.

3,872,354

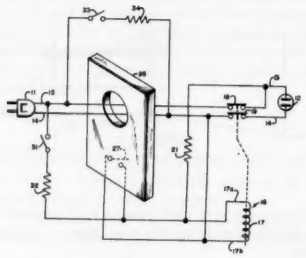
PORTABLE GROUND FAULT INTERRUPTER

David William Nestor, Oroville, and Paul E. Wible, Alamo, both of Calif., assignors to The Rucker Company, Concord, Calif.

Filed Nov. 19, 1973, Ser. No. 416,740

Int. Cl. H02h *3/28*

U.S. Cl. 317—18 D **7 Claims**



1. In a ground fault protective device, electrical contacts movable between closed and open positions for controlling the flow of current in conductors interconnecting a source and a load, a control element adapted for holding the contacts in their closed position when energized, a current limiting element connected between a first terminal of the control element and a first one of the conductors at a point on the load side of the contacts, the second terminal of the control element being connected to a second one of the conductors at a point which remains energized when the contacts are in their open position, ground fault responsive means for bypassing the control element to deenergize said element and cause the contacts to assume their open position in the event of a ground fault in the conductors, and reset switch means connected between the first terminal of the control element and the first conductor at a point on the source side of the contacts for reenergizing the control element to close the contacts when the ground fault has been eliminated.

3,872,355

FIRE DETECTION AND PROJECTION CIRCUIT AND DEVICE

Keith William Klein; Norman Thomas Swetnam, and Robert Allen Cahill, all of Simsbury, Conn., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 18, 1973, Ser. No. 398,492

Int. Cl. H02h *3/28*

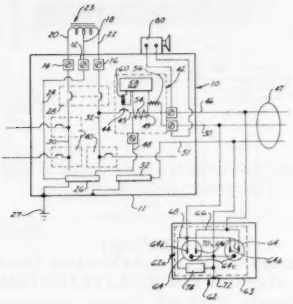
U.S. Cl. 317—18 D **6 Claims**

1. An abnormal condition detection system using conventional building electrical power distribution circuits which include a line conductor, a neutral conductor and a continuous, conductive ground circuit extending from a load center to various distributed load outlets, wherein the neutral conductor is connected to the ground circuit at a location in the vicinity of the load center, said system comprising, in combination:

A. means associated with the line and neutral conductors at a location intermediate the location of neutral conductor ground circuit connection and the load outlets for sensing a ground fault on either conductor;

B. an abnormal condition responsive detector located in the vicinity of one of the load outlets and electrically connected between the neutral conductor and the ground circuit,

1. said detector exhibiting a normally high electrical impedance until the condition to which said detector is



sensitive reaches a predetermined degree of abnormality, whereupon said detector exhibits a low impedance sufficient to simulate a ground fault on the neutral conductor of sufficient magnitude to produce a response by said sensing means; and

C. means responsive to said response of said sensing means for manifesting the existence of the abnormal condition.

3,872,356

THIN FILM ELECTRONIC CIRCUIT UNIT AND METHOD OF MAKING THE SAME

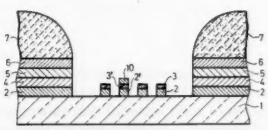
Gunter Kruger, Leonberg; Helmut Baum, Stuttgart, and Manfred Widmaier, Leonberg-Eltingen, all of Germany, assignors to Robert Bosch, GmbH, Stuttgart, Germany

Filed Oct. 30, 1972, Ser. No. 302,150

Claims priority, application Germany, Nov. 5, 1971, 2155029

Int. Cl. H05k *1/04*

U.S. Cl. 317—101 A **4 Claims**



1. A thin film electronic circuit unit of laminate structure comprising:

a substrate of insulating material;

a film of valve metal on said substrate partially covering said substrate in a first and a second pattern, said first and second patterns being electrically connected by at least one local contiguity and respectively defining a first and a second portion of said film, said first pattern defining circuit elements and said second pattern defining both contactable areas of a circuit and also circuit connections;

a film of valve metal oxide on said first portion of said film of valve metal, said first portion of said film of valve metal being of a thickness reduced relative to said second portion of said film of valve metal by the presence of said oxide film;

a first film of copper on said second portion of said film of valve metal;

a film of diffusion barrier metal on said first film of copper;

a second film of copper above said film of diffusion barrier metal, and

a coating of low-melting lead-tin solder on the outermost film of copper.

3,872,357

LINEAR SYNCHRONOUS MOTOR FOR HIGH-SPEED VEHICLES

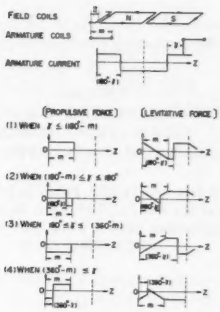
Naoki Maki, Ibaraki; Hironori Okuda; Sadaharu Kawai, and Tamotsu Tatsumi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 4, 1973, Ser. No. 357,117

Claims priority, application Japan, May 8, 1972, 47-45208

Int. Cl. H02k *41/02*

U.S. Cl. 318—135 **6 Claims**



1. A commutatorless linear synchronous motor for high-speed vehicles comprising field coils mounted on the vehicles, armature coils laid on the ground oppositely to said field coils, and means for supplying electric power to said armature coils such that both the propulsion and levitation forces are simultaneously generated for the vehicle by the cooperation of said field coils and said armature coils, said supply means controlling the phase of the armature current flowing in the armature coils such that the armature current rises up when an electrical angle γ for said armature coils is in the range expressed by the inequality

$$(180°/x - m/2 + u/2) < \gamma < (180° + 180°/x - m/2 + u/2)$$

where n is the number of phases of said armature coils, m the length of the a armature coils, u the overlapping angle, and x is 2 or n depending on whether the current in said armature coils is regulated by the full-wave control system or the half-wave control system, respectively.

3,872,358

SOLID ELECTROLYTIC CAPACITOR AND SOLID ELECTROLYTE THEREFOR

Mutsuaki Murakami, and Susumu Yoshimura, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Osaka, Japan

Filed June 11, 1973, Ser. No. 368,488

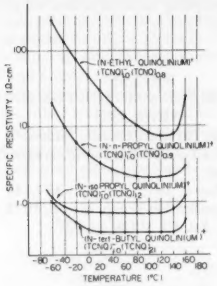
Claims priority, application Japan, June 13, 1972, 47-58881

Int. Cl. H01g *9/05*

U.S. Cl. 317—230 **7 Claims**

1. An electrolytic capacitor having improved thermal stability comprising a pair of electrodes, at least one of said electrodes being composed of a film-forming metal having a dielectric film thereon, and a solid electrolyte comprising a charge transfer complex composed of 7,7,8,8-tetracyanoquinodimethane and a nitrogen-containing hetero-

cyclic compound, said complex having at N-position of the heterocyclic compound a substituent group selected from an


SPECIFIC RESISTIVITY (Ω-cm)
100
10
1.0
(N-ETHYL QUINOLINIUM)+ (TCNQ)2 (TCNQ)3
(N-n-PROPYL QUINOLINIUM)+ (TCNQ)2 (TCNQ)3
(N-iso PROPYL QUINOLINIUM)+ (TCNQ)2 (TCNQ)2
(N-tert-BUTYL QUINOLINIUM)+ (TCNQ)2 (TCNQ)2
-80 -40 -20 0 20 40 60 80 100 120 140 160
-60 -20 20 60 100 140 180
TEMPERATURE (°C)

alkyl group containing from one to 18 carbon atoms, and a cycloalkyl group containing five to eight carbon atoms.

3,872,359

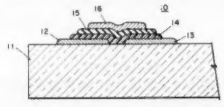
THIN FILM TRANSISTOR AND METHOD OF FABRICATION THEREOF

Alfred E. Feuersanger, 66 Overlook Drive, Franklin Square, N.Y. 01701

Division of Ser. No. 14,739, Feb. 24, 1970, which is a continuation of Ser. No. 723,769, April 24, 1968, abandoned. This application May 3, 1971, Ser. No. 139,841

Int. Cl. H0011 *11/14*

U.S. Cl. 357/4 **3 Claims**



1. A solid state device comprising:
a. an insulative substrate;
b. first and second spaced metal electrodes formed on said substrate;
c. a film of amorphous defect-nickel oxide having a resistivity not greater than 10^8 ohm-centimeters formed on said substrate, at least a portion of said film being formed in the separation between said first and second electrodes;
d. a film of insulating material of nickel oxide formed on the defect-nickel oxide film, at least a portion of the insulating film overlying a portion of the separation between said first and second electrodes, and
e. a gate electrode formed on the insulating film and overlying a portion of the separation between said first and second electrodes.

3,872,360

CAPACITORS WITH NICKEL CONTAINING ELECTRODES

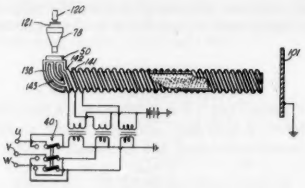
John Leo Sheard, Williamsville, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 8, 1973, Ser. No. 321,581

Int. Cl. H01g *1/01*

U.S. Cl. 317—258 **12 Claims**

1. A metallizing composition consisting essentially of finely divided noble metal(s) powder selected from the group consisting of gold, silver, platinum, palladium and mixtures thereof, an inert liquid vehicle, and a base metal diluent of one or more members selected from the group consisting of nickel and nickel-containing base metal alloys, the ratio of nickel to said noble metal being up to 1/1 by weight, the particles of



said metallization being of a size such that at least 90% of said particles are not greater than 50μ.

3,872,361

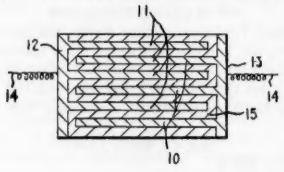
ELECTRODYNAMIC APPARATUS FOR CONTROLLING FLOW OF PARTICULATE MATERIAL

Senichi Masuda, 40-10-605, 1-chome, Nishigahara, Kita-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 366,655, June 4, 1973, which is a continuation of Ser. No. 151,789, June 10, 1971, which is a continuation of Ser. No. 237,822, March 24, 1972, Pat. No. 3,806,763. This application Oct. 18, 1973, Ser. No. 407,436The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

Int. Cl. H0b5 *5/02*

U.S. Cl. 317—262 E **4 Claims**



1. Apparatus for controlling the movement of powder-like particulate material along an elongated path which is defined by surface areas of solid material that surround a longitudinal centerline of said path, and for confining the particulate material to a zone near said centerline and against substantial lateral dispersal therefrom into contact with said surface areas, said apparatus comprising:
A. a plurality of elongated electrodes, each curved along its length to be substantially concentric to said centerline, said electrodes being spaced from one another along said path by substantially uniform distances, and adjacent electrodes along said path being curved to radii about said centerline that differ no more than slightly; and
B. means for connecting each of the electrodes with only one of the several terminals of a polyphase alternating high voltage source, and with each of said electrodes connected to a different one of said terminals than the electrodes that are longitudinally adjacent to it along said path, so that a constantly varying electric field is produced by each pair of the electrodes that are so adjacent whereby particles are urged toward said centerline, and so that the several electrodes cooperate to produce a net electric field of wave-like character that urges the particles in one direction along said path.

3,872,362
ELECTRIC TRACTION SYSTEMS AND VEHICLES COMPRISING SUCH SYSTEMS

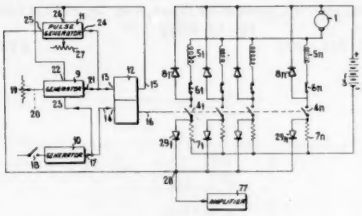
Jacques Lecoeuche, and Gerard Lacroux, both of Malakoff, France, assignors to ETS. E. Ragonot, Paris, France

Filed May 24, 1973, Ser. No. 363,336

Claims priority, application France, May 24, 1972, 72.18489

Int. Cl. H02r *5/16*

U.S. Cl. 318—139 **10 Claims**



1. Electric traction system comprising a separate excitation d.c. motor, an armature current control device, an excitation current control device, and between the motor armature and the d.c. supply source, several armature current switches (**4-1...4-***n*) in parallel each made up of one or more transistors connected in parallel (**30, 31, 32**) characterized in that in order to avoid possible non-synchronization of the switches each switch is connected at one terminal to an induction coil (**5-1...5-***n*) and in series with the armature of said motor, and at the other terminal with a diode (**8-1...8-***n*) shunting said induction coil and armature of the motor.

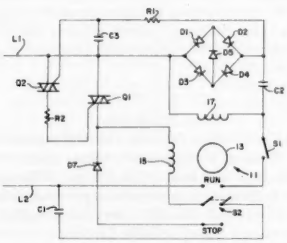
3,872,363
ELECTRIC MOTOR BRAKING SYSTEM

Thomas A. O. Gross, Concord Rd., Lincoln, Mass. 01773

Filed Mar. 11, 1974, Ser. No. 449,947

Int. Cl. H02p *3/20*

U.S. Cl. 318—212 **11 Claims**



1. An a.c. motor system providing dynamic braking, said system comprising:

a motor having a rotor and a stator having at least a pair of windings, said windings being displaced in phase around said stator;

switching means having a run state and a stop state, at least one of said windings being energized with a.c. in said run state to produce continued rotation of said rotor;

a braking circuit which, when energized, applies pulsating d.c. to one of said windings for braking said rotor, the pulsating component being coupled to the other of said windings while said rotor is rotating, said braking circuit being energizable only while said switching means is in said stop state; and

sensing means interconnected with said other winding and responsive to the pulsatile current component coupled thereto during braking for energizing said braking circuit as long as the amplitude of the coupled component exceeds a predetermined level and said switching means is in said stop state.

3,872,364
EXTINGUISHING ARRANGEMENT FOR THE INVERTERS OF AN ELECTRIC MOTOR

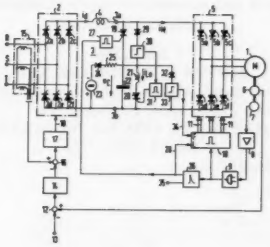
Klaus Hubner, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 20, 1973, Ser. No. 399,157

Claims priority, application Germany, Sept. 22, 1972, 2246592

Int. Cl. H02p *1/26*

U.S. Cl. 318—227 **4 Claims**



1. In a system including an electric machine coupled to an intermediate link converter including an inverter and control means associated therewith, an improved auxiliary extinguishing arrangement for inverter rectifiers of the inverter comprising:

a. a first controlled rectifier and a commutation capacitor in series across the intermediate link;

b. a second controlled rectifier and a reversing choke connected in series, with the series combination of said second controlled rectifier and said choke in parallel with said commutation capacitor;

c. the control means associated with said inverter providing firing pulses thereto; and

d. a first voltage detector arranged to detect the voltage at said capacitor, said voltage detector having an output coupled to said control means, said control means being responsive to be enabled by the output of said first voltage detector to permit firing pulses to be provided to the controlled rectifiers in said converter.

3,872,365
METHODS OF AND DEVICES FOR BRAKING AND INDEXING THE SPINDLE OF A MACHINE TOOL ROTATING AT HIGH SPEED

Jean-Pierre Vignaud; Claude Sebire, and Pierre Riss, all of Billancourt, France, assignors to Regie Nationale Des Usines Renault, Billancourt (Hauts de Seine), France

Filed Sept. 20, 1973, Ser. No. 399,247

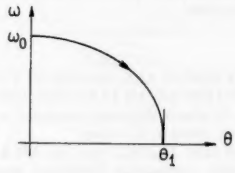
Claims priority, application France, Sept. 26, 1972, 72.34060; Aug. 3, 1973, 73.28484

Int. Cl. H02p *3/06*

U.S. Cl. 318—265 **5 Claims**

1. A method of braking and indexing a mechanical member rotating at high speed comprising triggering the starting point of a high-speed indexing phase, and monitoring a braking action at least partially according to an optimum velocity/space curve of parabolic shape during three successive phases, the first phase being along a substantially linear section of a velocity/time curve corresponding to the velocity-space curve of parabolic shape having a numerical or digital definition, the

second phase being along a linear velocity/time curve defined by a function generator and released below a certain threshold



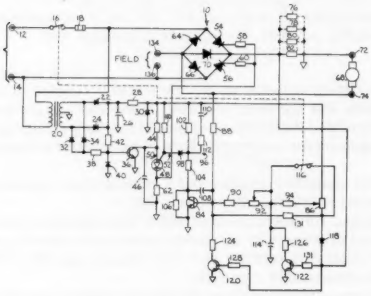
of said first phase, and the third phase being a final locking phase started in response to a predetermined final numerical information of said numerical or digital definition.

3,872,366

MOTOR CONTROL CIRCUIT

James Duncan Keith, Mount Wolf, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 21, 1973, Ser. No. 362,166
Int. Cl. H02p *5/16*
U.S. Cl. 318—331 **7 Claims**



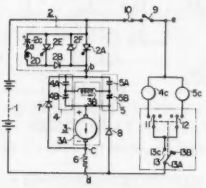
1. A D.C. motor control circuit having means for applying a selectively variable reference current supplied by a reference current generating means to the base of transistor having an emitter connected to common such that as the base of said transistor becomes more positive, the collector of said transistor becomes more negative thereby accomplishing phase invertion, said collector of said transistor is connected to a gate of a programmable unijunction transistor such that as the collector of said transistor becomes lower in potential the gate of the programmable unijunction will in a like manner become lower in potential thereby causing said programmable unijunction transistor having a ramp-shaped cyclic signal provided to the anode of said programmable unijunction transistor by a ramp-shaped cyclic signal producing means to turn on earlier in the cycle, the output pulse of said programmable unijunction transistor will therefore be advanced in phase, the cathode of said programmable unijunction transistor is turned on said silicon controlled rectifier will fire during a half-cycle of an A.C. power source which is synchronized with said ramp-shaped cyclic signal resulting in a higher voltage being applied to the armature of the motor being controlled, the armature being connected to said silicon controlled rectifier, a feedback signal current is taken from the negative terminal of said armature of said motor, the positive terminal of said armature being said common, and said signal current is fed via a first resistor to the base of the said transistor thereby generating a feedback current, the armature voltage will continue to increase until the feedback current substantially equals the reference current also being fed to the base of said transistor, thereby effecting stable voltage regulation of said motor being controlled.

3,872,367

ELECTRIC CAR CONTROLLING DEVICE

Sigeru Kuriyama, and Hideyuki Hashimoto, both of Katsuta, Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Aug. 17, 1973, Ser. No. 389,265
Claims priority, application Japan, Aug. 28, 1972, 47-85325
Int. Cl. H02p *3/08*
U.S. Cl. 318—373 **4 Claims**



1. An electric car controlling device comprising a series-connected circuit including a direct current power supply, a semiconductor chopper circuit, a direct current electric motor circuit including a field circuit and an armature circuit of a direct current electric motor and means for changing over the polarity of said armature in said direct current electric motor relative to that of said field thereof, and a current detecting circuit; a plugging diode circuit including said current detecting circuit and arranged in opposite polarity relative to a power supply voltage for providing a parallel circuit to said armature; and circuit means for controlling the conduction and cutting off of said semiconductor chopper circuit, said circuit means including a current controller for acting on said semiconductor chopper circuit so as to confine current within a predetermined region in dependence on the current detected by said current detecting circuit, and a plugging current control circuit responsive to the output of said chopper circuit and the output current of said current detecting circuit for changing said predetermined region upon detecting the state of plugging, said plugging current control circuit including circuit means for amplifying the output current of said current detecting circuit.

3,872,368

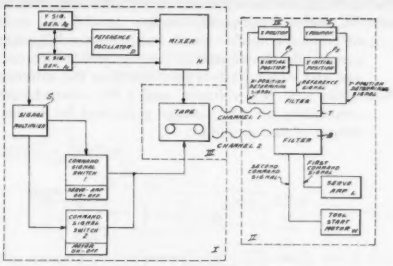
MULTIPLEX SIGNAL PROGRAM SERVO-MECHANISM

Vincent P. Friberg, Longmeadow, Mass.; John Chesney, Roselle Park, N.J., and Richard B. Phelps, Wilbraham, Mass., assignors to General Instrument Corporation, Newark, N.J.

Filed Sept. 12, 1973, Ser. No. 396,504
Int. Cl. G05b *19/100*
U.S. Cl. 318—567 **16 Claims**

1. A servo mechanism for controlling the movement of a tool or the like comprising a transmitting stage and a receiving stage, said transmitting stage and said receiving stage being coupled by a dual channel medium, said transmitting stage comprising first and second sections, said first section comprising means generating position determining signals of a first and a second type and means for combining said first and second type position determining signals to form a first transmission signal, and said second section comprising means generating a command signal and means for converting said command signal into a second transmission signal, said medium having a first channel to carry said first transmission signal and a second channel to carry said second transmission signal, said receiving stage comprising means for segregating said first transmission signal into said first and second type

position determining signals and means for moving the tool in accordance therewith, and means responsive to said command



signal of said second channel to control said moving means in accordance therewith.

3,872,369

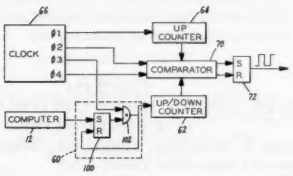
PULSE COUNTING PHASE MODULATION METHOD AND APPARATUS FOR CONTROLLING A SERVO-MECHANISM

Leonard G. Rich, West Hartford, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Continuation of Ser. No. 169,263, Aug. 5, 1971, abandoned. This application Sept. 28, 1973, Ser. No. 401,572

Int. Cl. G05b *19/28, 1/01*

U.S. Cl. 318—603 **18 Claims**



1. Apparatus for controlling the output of a servomotor comprising: a cyclically driven digital counter having an output providing a periodic reference waveform at a frequency which is a submultiple of the digital counting rate; a digital command signal register having an input through which a single, complete digital command signal for positioning the servomotor output at one discrete position is received for temporary storage until another discrete position is commanded; input means connected with the input of the command signal register for loading new command signals into the register; comparator means connected between the digital counter and the command signal register for comparing the digital counts and the digital command signals and producing coincidence signals at each coincidence of the digital count and the digital command signals; timing means connected with the digital counter, the input means and the comparator means for stepping the digital counter, loading the command signal register and comparing the digital counts and the command signals respectively at distinctly different times; generating means connected to the comparator means and responsive to the coincidence signals for producing a periodic command signal waveform having the same period or frequency as the reference waveform and a phase relationship with the reference waveform uniquely related to the command signal in the register; the comparator means and the generating means cooperating whenever operating to continuously produce the periodic command signal waveform in response to a single and complete digital command signal stored in the command signal register; and phase responsive motor control means connected with the servomotor, the generating means and the digital counter and including a phase detector responsive to the reference waveform provided by the digital counter and the command signal waveform produced by the generating means for positioning the output of the servomotor in accordance with the phase relationship of the periodic waveforms.

3,872,370

HIGH-VOLTAGE D.C. GENERATOR, SPECIALLY FOR ENERGIZING AN ELECTROSTATIC APPARATUS

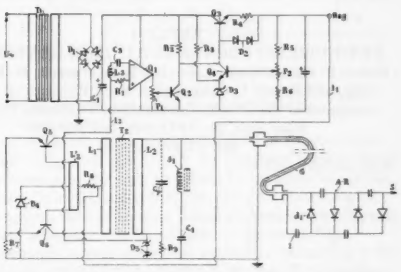
Alain Regnault, Noailles, France, assignor to Redelec, Societe a responsabilite limitee, Moulin de Pierre, France

Filed Mar. 2, 1973, Ser. No. 337,569

Claims priority, application France, Mar. 3, 1972, 72.07505; Sept. 28, 1972, 72.34310

Int. Cl. B05b *5/00*

U.S. Cl. 317—3 **10 Claims**



1. A high-voltage d.c. generator capable of at least a few tens of kilovolts, for energizing an electrostatic apparatus having a charge electrode, specially an electrostatic paint spraying apparatus, and electrostatic powdering apparatus, an electrostatic filtering apparatus, and the like, said generator comprising a self-oscillating circuit producing an alternating current having a frequency of at least 20,000 Hz, a single transformer located in the vicinity of said self-oscillating circuit and having a primary winding connected to the output of said self-oscillating circuit, and a secondary winding, at least one dielectric plate having deposited on both faces a plurality of conductive layers forming the respective plates of miniaturized capacitors of very low values, another plurality of miniaturized solid-state diodes, having very low self-capacities, said diodes being directly soldered to said capacitor plates to form an adder-rectifier of the type comprising a number of identical stages connected in parallel to one another, which adder-rectifier is embedded in a block of molded resin or resin compound and is incorporated in the electrostatic apparatus in a very close relationship to its charge electrode, the output of said adder-rectifier being connected directly to said charge electrode, and a flexible coaxial cable having a predetermined length, said cable connecting the secondary winding of said transformer directly to the input of said adder-rectifier.

3,872,371

POWER CONTROL SYSTEM

Albert M. Williams, Box 25262, Los Angeles, Calif. 90025

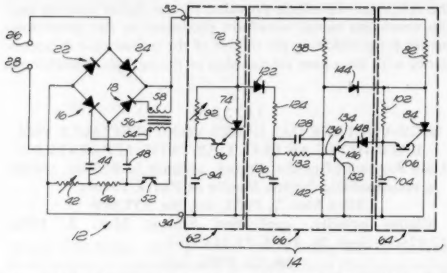
Filed Jan. 28, 1974, Ser. No. 437,269

Int. Cl. H02m *7/00*

U.S. Cl. 321—16 **3 Claims**

1. A power control system comprising: a range power control means; and a power distribution control circuit cascaded with said range power control means for distributing power which is equal to a predetermined value from said range power control means through a plurality of loads said power distribution control circuit comprising an independent section

and a dependent section, each having a load, and wherein changes in power output of said independent section load in



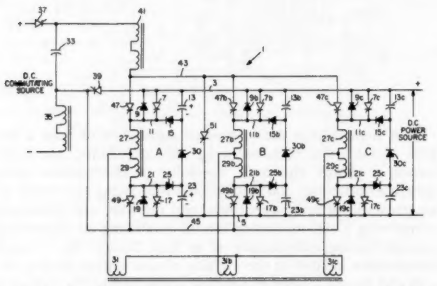
turn varies the power output of said dependent section resulting in a constant power distribution between said loads.

3,872,372

DV/DT CIRCUIT FOR USE IN D.C. LINK CONVERTERS

Robert F. Kautz, Spring Lake; Leo B. Bourgeault, Wall Township, and Robert C. Eckenfelder, Point Pleasant, all of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Sept. 21, 1973, Ser. No. 399,656
Int. Cl. H02m *1/08*
U.S. Cl. 321—45 C **8 Claims**



1. A circuit for controlling the rate of change (dv/dt) of forward blocking voltage reapplied across a silicon controlled rectifier to prevent the silicon controlled rectifier from conducting after the silicon controlled rectifier is turned off, comprising a resonant inductance-capacitance network including a series connected capacitor and diode connected in parallel with the silicon controlled rectifier and an inductance connected in series with the silicon controlled rectifier, the diode being poled to conduct in the same direction as the silicon controlled rectifier, the network having a time constant to insure a rate of change (dv/dt) of voltage reapplied across the silicon controlled rectifier to prevent the silicon controlled rectifier from conducting after the silicon controlled rectifier is turned off.

3,872,373

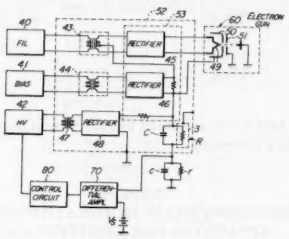
DC HIGH-VOLTAGE GENERATING SYSTEM

Yasushi Saito, 663 Ichige, and Sadayasu Ueno, 1030 Ichige, both of Katsuta, Japan

Filed Dec. 9, 1970, Ser. No. 96,458
Claims priority, application Japan, Dec. 10, 1969, 44-98602; July 22, 1970, 45-63607
Int. Cl. G05f *1/50*
U.S. Cl. 323—17 **4 Claims**

1. A DC high-voltage generating system including a DC high-voltage power supply, filtering means connected with said DC high-voltage power supply for smoothing the output thereof and voltage stabilizing means for said DC high-voltage generating system, said voltage stabilizing means comprising: voltage-dividing means including a high-voltage high-resistance reference resistor and a low-resistance resistor to be applied with a relatively low voltage, said voltage-dividing means being connected in series with the output terminal of said DC high-voltage power supply;

a differential amplifier which compares a voltage appearing across said low-resistance resistor with a reference voltage and which detects and amplifies the difference between said two voltages, and a DC control circuit for controlling the DC voltage generated by means of an output of said amplifier;



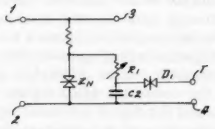
said high-voltage high-resistance reference resistor essentially consisting of a high-voltage resistor element, an insulating member wound tightly in layers over the entire outer surface of said high-voltage resistor element, and a first grounded metal case filled with an insulating fluid in which said resistor element is disposed, said high-voltage high-resistance reference resistor being disposed together with said filtering means in a second grounded metal case which is filled with an insulating oil.

3,872,374

POWER CONTROL TIMING CIRCUITS WITH POWER LINE COMPENSATION

Clarence E. Rasmussen, Euless, Tex., assignor to Electronic Control Corporation, Euless, Tex.

Continuation of Ser. No. 673,538, Oct. 4, 1967, abandoned. This application July 28, 1970, Ser. No. 64,093
Int. Cl. G05f *3/04*
U.S. Cl. 323—22 SC **8 Claims**



1. In a power control circuit including a source of AC line voltage, and a load and grated power control device in series across the source of AC line voltage; a line voltage compensating timing network coupled across the source of AC line voltage comprising a charging potential network including a negative impedance device and a first resistor in series for establishing a charging potential from the source of AC line voltage and a capacitive timing network having a second resistor and timing capacitor in series shunting said negative impedance device whereby the charging potential is applied to said timing capacitor, and said timing capacitor coupled to the gate of said power control device.

3,872,375
AIRBORNE ELECTROMAGNETIC PROSPECTING METHOD AND APPARATUS

Vaino Ronka, Burnaby, British Columbia, Canada, assignor to Hudson Bay Mining and Smelting Co., Limited, Toronto, Ontario, Canada

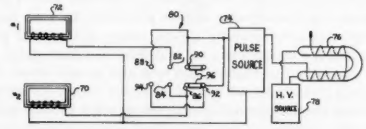
Filed Nov. 12, 1973, Ser. No. 414,923
Int. Cl. G01v 3/16
U.S. Cl. 324—4 10 Claims

1. The method of electromagnetic prospecting which comprises:
- mounting a transmitting coil on a first transport body;
- mounting a receiving coil on a second transport body in coaxial alignment with the transmitting coil;
- moving the first and second transport bodies along different, substantially parallel, horizontal paths at an angle to the common axis of the transmitting and receiving coils, while maintaining substantially coaxial alignment of said coils;
- transmitting from the transmitting coil a primary alternating electromagnetic field thus causing a secondary electromagnetic field due to anomalies in the earth;
- sensing the resultant field at the receiving coils, and
- compensating for unwanted changes in the primary field due to small misalignments of said transmitting and receiving coils by maintaining a fixed distance between the receiving coil and a point on the common axis between the coils at a predetermined distance from the transmitting coil.

3,872,376
IGNITION TIMING DEVICE AND METHOD

Barry R. Kalenevitch, 5090 Franklin St., Harrisburg, Pa.

Filed Sept. 13, 1973, Ser. No. 396,898
Int. Cl. F02p 17/00
U.S. Cl. 324—17 6 Claims

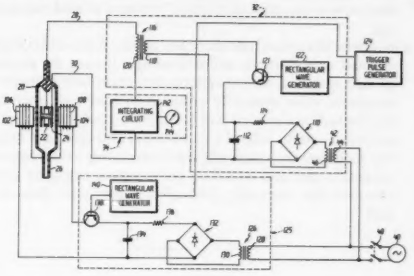


1. A device for timing and synchronizing the ignition of an internal combustion engine during operation of the engine where the engine includes a distributor having a pair of independently adjustable breaker points opened and closed by a rotatable cam so that each breaker point fires a spark plug at a given time, a fixed timing pointer and a rotatable timing mark connected with the cam for rotation therewith past the timing pointer, the invention comprising a pair of electronic signal pick-up means each associated with one conductor running from one of the sets of points in the distributor to its respective spark plug for sensing the firing of the spark plug during operation of the internal combustion engine, light source means for producing a flash of light in response to the spark plug firing signal as sensed by either or both of said pick-up means, and three position switching means joining said pick-up means and said light source means for connecting either or both of said pick-up means to said light source means so that during operation of the engine the light source means illuminates the timing pointer and timing marks upon firing of either or both of the spark plugs, depending upon the position of the switching means.

3,872,377
COLD CATHODE IONIZATION GAUGE

Katsuhiro Kageyama, and Shinhachi Utsunomiya, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Company, Ltd., Kawasaki-shi, Kanagawa-ken, Japan

Filed Oct. 11, 1972, Ser. No. 296,531
Int. Cl. G01n 27/62
U.S. Cl. 324—33 14 Claims

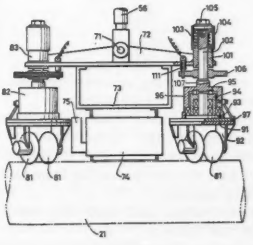


1. A cold cathode ionization gauge comprising:
- an evacuated envelope;
- a pair of electrodes separately disposed in the envelope;
- a high voltage pulse generator for supplying a high voltage substantially rectangular pulse of a duration of substantially 10 milliseconds between said pair of electrodes;
- a magnetic field generating means for applying a magnetic field along the axis of said pair of electrodes; and
- a discharge current measuring circuit for measuring a discharge current flowing between the pair of electrodes.

3,872,378
APPARATUS FOR SUPPORTING AND PROPELLING MATERIAL THROUGH MAGNETIC FLAW DETECTION DEVICES

Toshio Shiraiwa, Nara, and Tatsuo Hiroshima, Minoo, both of Japan, assignors to Sumintomo Metal Industries, Limited, Osaka Japan

Continuation of Ser. No. 185,688, Oct. 1, 1971, abandoned, which is a division of Ser. No. 21,062, March 19, 1970, Pat. No. 3,670,239. This application Nov. 12, 1973, Ser. No. 414,943
Int. Cl. G01r 33/12
U.S. Cl. 324—37 4 Claims



1. Apparatus for supporting and propelling a material to be inspected through a magnetic flaw detection device, comprising:
- a feeding device for propelling said material;
- a plurality of flaw detection devices mounted at spaced intervals along the path of travel of said material;
- each of said flaw detection devices including a support structure, a shaft suspended vertically from said support structure, and a base member pivotally mounted at an

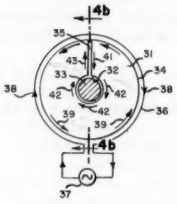
end of said shaft adjacent said material, opposite ends of said pivoted base member including a rotatable turret resiliently mounted thereto, each of said rotatable turrets including means for indexing said turret about the vertical axis thereof and a pair of spaced rollers contacting said material for guiding said material along its path of travel, whereby the angle of said rotatable turret with respect to the longitudinal axis along which said material moves determines the amount of spiral rotation of said material; and

a magnetic detection unit mounted between the ends of said pivoted base member and extending adjacent the surface of said material, said magnetic detection unit includes a magnetic yoke assembly coupled to said base member and including a spaced pair of magnetic poles mounted to extend on either side of said material and said base member includes means for resiliently mounting said magnetic detection unit and including guide rollers engaging guide channels for vertically guiding said magnetic detection unit.

3,872,379
EDDY CURRENT TESTING APPARATUS USING SLOTTED MONOTURN CONDUCTIVE MEMBERS

Robert A. Brooks, Rye, N.Y., and John Paul Wallace, Fort Defiance, Va., assignors to Magnetic Analysis Corporation, Mount Vernon, N.Y.

Filed Aug. 29, 1973, Ser. No. 392,509
Int. Cl. G01r *33/14*
U.S. Cl. 324—40 **22 Claims**



1. Eddy current testing apparatus for the non-destructive testing of objects which comprises

a. a monoturn conductive member having an inner aperture for receiving an object to be tested and a surface encircling the aperture and spaced therefrom,

b. a slot in said member extending from said aperture to said encircling surface,

c. a coil encircling said encircling surface for inducing current flow therein,

d. means for supplying alternating or pulsed current to said coil,

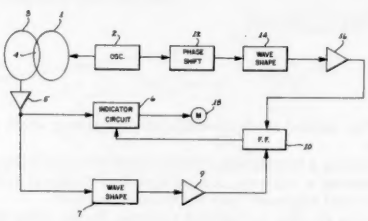
e. said monoturn conductive member being designed and adapted for producing current flow around the surface of said aperture opposite in direction to current flow in said encircling surface in response to said current in said coil and thereby produce a magnetic field to induce eddy currents in an object located in the aperture,

f. and detecting and indicating means responsive to variations in said eddy currents for indicating variations in said objects.

3,872,380
METAL DETECTOR DISTINGUISHING BETWEEN DIFFERENT METALS BY USING A BIAS CIRCUIT ACTUATED BY THE PHASE SHIFTS CAUSED BY THE METALS

Robert F. Gardiner, 4729 N. 7th Ave., Phoenix, Ariz. 85013

Filed Jan. 2, 1974, Ser. No. 429,958
Int. Cl. G01r *33/12*
U.S. Cl. 324—41 **3 Claims**



1. A metal detector for detecting the presence of, and distinguishing between, certain types of metallic objects, comprising: an oscillator; a transmitting coil connected to said oscillator for transmitting electromagnetic signals generated by said oscillator; a receiving coil mounted in proximity to said transmitting coil for receiving electromagnetic signals transmitted by said transmitting coil, the received electromagnetic signals being changed in amplitude and phase when a metallic object is placed in the path of said electromagnetic signal transmitted by said transmitting coil; an indicator means for providing a reading to an operator when a metallic object has been detected, said indicator means including a meter and an indicator circuit for receiving electromagnetic signals from said receiving coil and providing a DC current to said meter in response thereto, said indicator circuit responsive to biasing to reduce said DC current and reduce the meter reading; means connected to said indicator means and to said receiving coil responsive to an increase in amplitude of said received signals for increasing the reading of said indicator means; first wave shaping means connected to said receiving coil for producing a first short duration pulse; a phase shift circuit connected to said oscillator for imposing a predetermined phase shift upon electromagnetic signals generated by said oscillator; a second wave shaping means connected to said phase shift circuit for producing a second short duration pulse; and means connected to receive said first and second short duration pulses and connected to said indicator circuit for applying the biasing thereto for decreasing the reading of said meter.

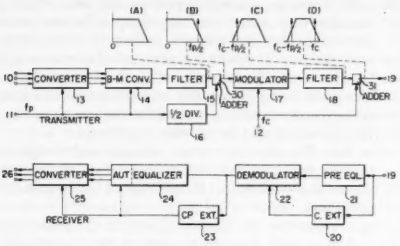
3,872,381
DIGITAL TRANSMISSION SYSTEM

Hajime Yamamoto, and Kazuhiro Watanabe, both of Tokyo, Japan, assignors to Nippon Telephone and Telephone Public Corporation, Tokyo, Japan

Filed Aug. 24, 1972, Ser. No. 283,527
Claims priority, application Japan, Aug. 28, 1971, 46-66215
Int. Cl. H04b *1/12*
U.S. Cl. 325—42 **5 Claims**

5. In a method for digital pulse transmission of the type including transmission of a vestigial sideband or single sideband multi-level pulse modulated signal in which the level is zero at determined instants before and after the maximum level and having a clock signal and a carrier inserted at the opposite ends of the band of the modulated signal, receiving the transmitted signal and extracting the carrier from the received signal, demodulating the received signal by the carrier, extracting the clock signal from the demodulated signal, and converting the demodulated signal to a multi-level pulse signal with the extracted clock signal, the improvement comprising the steps of detecting voltages representative of the

amount of intersymbol interferences at two first points adjacent a center point of the waveform of the demodulated signal less said clock signal, said first points and center point corresponding to the instants of zero level and maximum level



respectively of the multi-level pulse signal and controlling the phase of said extracted clock signal to reduce the difference between the voltages representative of intersymbol interferences detected at said two first points to zero.

3,872,382

MAGNETIC FIELD MEASURING APPARATUS WITH FREQUENCY INDEPENDENT SENSITIVITY

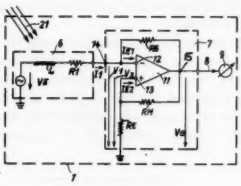
Joachim Bertram, Bremen-Osterholz, and Wilfried Meuser, Bremen, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Apr. 9, 1973, Ser. No. 350,614

Claims priority, application Germany, Apr. 22, 1972, 2219780

Int. Cl. G01r *33/02*

U.S. Cl. 324—43 R **13 Claims**



1. In a circuit arrangement for detecting very weak alternating external magnetic fields "and for measuring same with a sensitivity which is independent of the frequency of the field", including a receiver coil, having no iron core and having an inductive reactance and a natural ohmic resistance, for inductively detecting the external magnetic field, and an electronic amplifier circuit connected in series with the receiver coil, the improvement wherein the input resistance of said amplifier circuit is, in a good approximation, of the same values but of opposite sign as said natural ohmic resistance of said receiver coil.

3,872,383

VISUAL GROUND FAULT INDICATOR

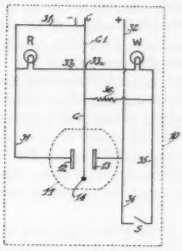
Edward Kolodziej, 5616 W. 5th Ave., Gary, Ind. 46404

Filed Dec. 7, 1973, Ser. No. 422,696

Int. Cl. G01r *31/02*

U.S. Cl. 324—51 **2 Claims**

1. A ground fault indicating receptacle comprising a frontal panel with an outlet presenting a pair of service terminals and a ground terminal, red and white signal lamps mounted in the panel, a switch also mounted in the same and operable to light the white lamp in case of a normal ground connection and the red lamp in case of an interrupted ground connection, a resistance element, a circuit for said lamps, resistance element and switch, including a ground line connected to said ground terminal, a grounded negative feed line connected to one service terminal and a positive feed line connected to the other service terminal wherein one terminal of each lamp is



connected to the ground line, the other terminal of the red lamp is connected to the grounded negative feed line and said one service terminal, the other service terminal is connected to one side of the switch, the other terminal of the white lamp is connected to the other side of the switch and said resistance element interconnects said other terminal of the white lamp with the ground line.

3,872,384

ELECTRICAL WIRING, CIRCUIT, ENERGIZATION, AND RESISTANCE TEST APPARATUS

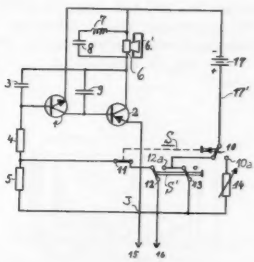
Heinz Laass, Hahn, Germany, assignor to Taco-Tafel GmbH & Co. KG, Esslingen(Neckar), Germany

Filed Feb. 6, 1974, Ser. No. 439,914

Claims priority, application Germany, Mar. 6, 1973, 2311012

Int. Cl. G01r *31/02*

U.S. Cl. 324—51 **11 Claims**



1. Industrial wiring, circuit, energization, and resistance test apparatus having acoustic output to test for line resistance, insulation resistance, or voltage levels and polarities arising in an electrical sample network comprising

a two-stage electrical oscillator-amplifier circuit (**1, 2, 3, 4, 5**) having two transistors (**1, 2**) connected in cascade, and an R/C circuit (**3, 4, 5**), the relative values of resistance and capacity of which affect the frequency of operation thereof, the capacitor (**3**) of said R/C circuit connecting the output of the second transistor (**2**) to the input of the first transistor (**1**) to provide for feedback of said oscillator circuit, said first transistor (**1**) having a bias circuit including a high value resistor (**5**) of said R/C circuit and forming a portion of the bias circuit;

audio transducer means coupled to said oscillator circuit for reproducing the tone thereof;

a source of d-c voltage (17) and a low resistance connection (17') from said sources to the transistors (1, 2) of the oscillator circuit;

test connection means (15, 16) to which the sample circuit is connectable;

and switch means (S') connected to said test connection means and to the oscillator circuit to selectively connect:

a. when the switch means is in one position, the test connection means (15, 16) in parallel to the resistor (5) to test the sample network for

a-1. insulation resistance between test connection means to check for insulation of an open circuit between said test connection means, the value of the total resistance being introduced by the resistor (5) and the insulation resistance connected in parallel thereto determining and controlling the pitch of the tone reproduced by the transducer means as an analog of said total resistance, or

a-2. voltage levels therein, in that introduction of a foreign voltage to the test connection means will affect the bias voltage across resistor (5) and disturb the balanced state of the oscillator circuit to change the frequency of oscillations to a different pitch whereby the level and/or polarity of the foreign voltage source can be determined; and

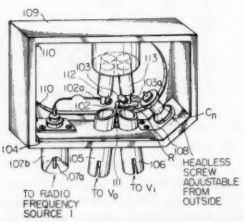
b. when the switch means is in another position, the test connection means (15, 16) in series with said d-c source (17) and the low resistance connection (17') to interrupt the circuit from said source to the oscillator means unless the sample network has ZERO, or essentially ZERO or low resistance to provide an output test oscillation from the oscillator circuit, the pitch of which is indicative of the resistance of the sampling network placed in series between said source and the oscillator circuit.

3,872,385

FIXTURE FOR MEASURING PARAMETERS OF QUARTZ CRYSTAL UNITS

Issac Koga; Shigeo Kobayashi, and Isao Okamoto, all of Tokyo, Japan, assignors to Kabusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 372,165, June 21, 1973, Pat. No. 3,832,636. This application Mar. 5, 1974, Ser. No. 448,398
Claims priority, application Japan, June 28, 1972, 47-64064
Int. Cl. G01r *29/22*
U.S. Cl. 324—56 **2 Claims**



1. A fixture for measuring parameters of crystal units comprising

a. two pairs of sockets,

the first pair being adapted for inserting a crystal unit (say A) which may be freely selected from a plurality of crystal units to be tested and a crystal unit (say C) which is selected from the remainder of said plurality of crystal units, alternately,

the second pair being adapted for inserting probetips of voltmeters thereinto,

the first sockets of said two pairs are directly coupled together,

the second sockets of said two pairs are directly coupled together;

b. two probe receptacles which are connected to each other with a wedge shaped copper plate, and when probe sheaths are inserted into said receptacles, the probe-tips thereof are inserted into the sockets of second pair;

c. a circuit (say B) which is composed of a resistor in parallel with a variable capacitor (C_n), the first terminal of the circuit B being connected to said second sockets, the second terminal of the circuit B being connected to junction points of said two probe receptacles;

d. a large flat plate of copper whereto said wedge shaped copper plate, said probe receptacles and said second terminal of said circuit B are coupled for equalizing their potentials, and;

e. a connector for supplying a radio frequency current from a radio frequency source to the crystal unit to be tested which is inserted into the sockets.

3,872,386

TEST DEVICE

Gabriel J. Luhowy, 7181 College St., Lima, N.Y. 14485

Filed May 7, 1973, Ser. No. 358,089
Int. Cl. G01r *17/02, 19/14*
U.S. Cl. 324—98 **3 Claims**

1. A measuring system comprising in combination,

a precision selectable first voltage,

a differential operation amplifier having a pair of inputs and an output with one of said inputs connected to said first voltage,

means coupled to the other of said inputs for providing an unknown input signal of a second voltage representing a predetermined condition,

a pair of light emitting diodes normally in the same one of their on-off states,

first voltage amplifying means coupled to said output and responsive to one of said polarities to change the state of one of the diodes,

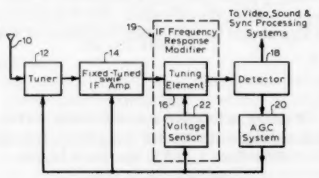
second voltage amplifying means coupled to said output and responsive to the other of said polarities to change the state of the other of said diodes and calibrating means for adjusting said first voltage to retain said diodes in the one of their on-off states, wherein the first and second means comprise driving transistors of opposite conductivity type.

3,872,387

FREQUENCY RESPONSE MODIFIER FOR FIXED-TUNED IF AMPLIFIERS

Frank G. Banach, Oak Lawn, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 29, 1972, Ser. No. 293,611
Int. Cl. H04b *1/16*
U.S. Cl. 325—427 **7 Claims**



1. In a television receiver having a fixed-tuned IF amplifier with an IF frequency response characteristic determined by a

surface wave integratable filter for selectively amplifying a range of intermediate frequency components of a received television signal associated with a plurality of intermediate frequency carriers therein, a frequency response modifier, comprising:

variable bandwidth means coupled to the output of the fixed-tuned IF amplifier and having no frequency response characteristics, the first of said frequency response characteristics being relatively non-selective and wide-band over the IF frequency range and the second of said frequency response characteristics being relatively more narrow-band with a peak in its frequency response curve at or near the frequency of one of said plurality of intermediate carriers;

means for generating a variable control signal; and

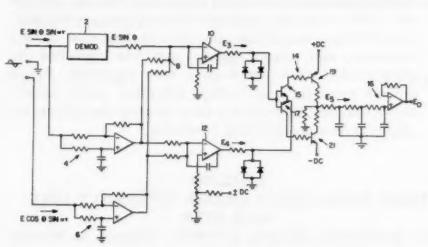
selector means responsive to predetermined amplitude levels of said control signal for selecting and cascading with said fixed-tuned IF amplifier one of said frequency response characteristics associated with said variable bandwidth means, said wide-band frequency response being selected in response to a first predetermined level of the control signal and said narrowband frequency response being selected in response to a second predetermined level of said control signal.

3,872,388

RESOLVER TO DC CONVERTER

Robert L. James, Bloomfield, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Aug. 31, 1972, Ser. No. 285,267
Int. Cl. H03d *13/00*
U.S. Cl. 328—133 **7 Claims**



1. For use with a signal device of the type including an angularly displaceable element and providing two alternating signals varying as the sine and cosine of the angular displacement, a converter for converting said signals to a signal at a level corresponding linearly to the angular displacement, comprising:

means connected to the signal device and responsive to the sine and cosine signals therefrom for providing a first reference signal including a first phase shifting circuit connected to the signal device for shifting the phase of the sine signal therefrom, a second phase shifting circuit connected to the signal device for shifting the phase of the cosine signal therefrom, and means for combining the phase shifted signals for providing the first reference signal;

means connected to the signal device and to the first reference signal means and responsive to one of the signals from the signal device and to the first reference signal for providing a signal having a predetermined waveform;

means connected to the first reference signal means and responsive to the signal therefrom for providing a second reference signal; and

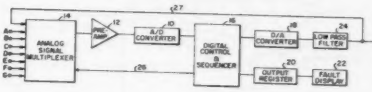
means connected to the predetermined waveform signal means and to the second reference signal means and responsive to the signals therefrom for providing the signal at a level corresponding linearly to the angular displacement.

3,872,389

SIGNAL PROCESSOR

Frank G. Willard, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 12, 1974, Ser. No. 441,923
Int. Cl. G06g *7/14*; **H03k** *5/20*
U.S. Cl. 328—137 **8 Claims**



1. In a signal processor for operation with a plurality of input signals, the combination of

means for sequentially sensing each of said plurality of input signals in a desired time relationship,

means for establishing a control signal which has a predetermined numerical relationship with said plurality of input signals,

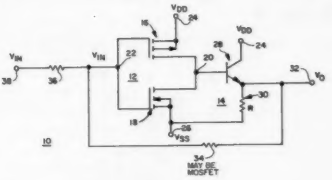
means for comparing each one of said sensed input signals with said control signal to select those input signals falling within a predetermined tolerance with said control signal, means for substituting said control signal instead of any one input signal not selected by said means for comparing.

3,872,390

CMOS OPERATIONAL AMPLIFIER WITH INTERNAL EMITTER FOLLOWER

Harold Garth Nash, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Dec. 26, 1973, Ser. No. 427,752
Int. Cl. H03f *3/18*
U.S. Cl. 330—13 **6 Claims**



1. An integrated circuit operational amplifier comprising:

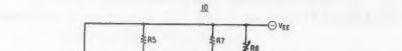
a non-switching CMOS gain circuit;

an output circuit including a bipolar transistor having its base connected to an output of said CMOS gain circuit and having its emitter connected to an output of said integrated circuit operational amplifier for providing low output impedance; and, bias means coupled to said output of said integrated circuit operational amplifier and to an input of said non-switching CMOS gain circuit for biasing said non-switching CMOS gain circuit to provide gain for said integrated circuit operational amplifier proportional to a ratio of resistors of said bias circuit means, said bias circuit means including a first resistor connected between an input of said integrated circuit operational amplifier and said input of said non-switching CMOS gain circuit and a feedback resistor connected between said output of said integrated operational amplifier and said input of said non-switching CMOS gain circuit.

3,872,391
BALANCED LINE DRIVER

James Edwin Dalley, Sherrelwood Estates, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 16, 1974, Ser. No. 433,657
Int. Cl. H03f 3/04
U.S. Cl. 330—14 10 Claims

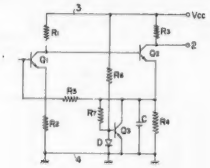


7. A driver for a balanced line comprising an input terminal, first and second transistors of a first conductivity type, means for providing substantially the same potential at the bases of said first and second transistors, means for coupling an input signal applied to said terminal to the bases of said first and second transistors, means for connecting the collector of said first transistor to one side of said balanced line, means for connecting the emitters of said first and second transistors to a first fixed potential, and means responsive to collector current of said second transistor for generating a current on the other side of said balanced line.

3,872,392
CASCADE DIRECT-COUPLED AMPLIFIER

Yoshio Sakamoto, and Shinsuke Iguchi, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 26, 1973, Ser. No. 382,693
Claims priority, application Japan, July 6, 1972, 47-74178
Int. Cl. H03f 3/04
U.S. Cl. 330—19 8 Claims

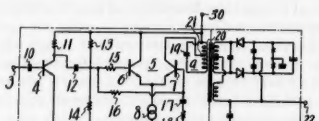


1. In a cascade direct-coupled amplifier having a supply voltage source, a first grounded-emitter transistor connected to said supply voltage source, a second grounded-emitter transistor which is connected DC-wise to said first transistor and to said supply voltage source, and a bias circuit which supplies a bias current from the emitter of said second transistor to the base of said first transistor, the improvement comprising current absorbing circuit means for providing an absorption current which varies in proportion to changes in said supply voltage source and which is connected to said emitter of said second transistor, said current absorbing circuit means including a third grounded-emitter transistor having its collector connected to the emitter of said second grounded-emitter transistor, and a resistor and a diode connected in series between said supply voltage source and ground, the base of said third transistor being connected to the point of connection of said resistor and said diode.

3,872,393
IF AMPLIFIER

Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 26, 1973, Ser. No. 419,108
Claims priority, application Japan, Dec. 26, 1972, 48-833[U]
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 5 Claims

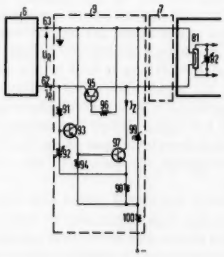


1. An IF amplifier comprising:
a. a voltage source;
b. a differential amplifier having first and second transistors whose emitter electrodes are connected to each other and to a voltage reference point through a common emitter impedance and whose collection electrodes are connected to the voltage source through a signal output means, a base electrode of said first transistor being supplied with an input signal, said differential amplifier being used as an IF final stage to which a frequency discriminator is connected;
c. attenuating means consisting of first and second resistors and a first capacitor, said first resistor being connected between the base electrodes of said first and second transistor, said second resistor and first capacitor are connected in series between a base electrode of said second transistor and voltage reference point respectively, said means being of a value to keep the differential amplifier in non-saturating condition.

3,872,394
PILOT REGULATED CARRIER FREQUENCY LINE AMPLIFIER

Peter Bartenstein, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 11, 1973, Ser. No. 359,272
Claims priority, application Germany, Apr. 18, 1973, 2319784; May 19, 1972, 2224621
Int. Cl. H03f 3/66
U.S. Cl. 330—52 4 Claims



1. A pilot controlled carrier frequency line amplifier arrangement comprising: an amplifier having an input and an output; a feedback network connected between said output and said input of said amplifier and including a temperature responsive variable resistor and a heating coil for said variable

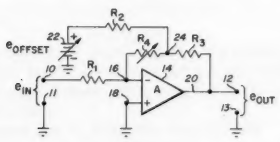
resistor energizable to control the frequency pass characteristic of said arrangement; and a control circuit connected between said amplifier and said heating coil for controlling the energization of said heating coil in accordance with the magnitude of the pilot, said control circuit including a pilot evaluating means connected across said heating coil for deriving a current representing the relative value of the pilot with respect to a reference and a limiting transistor having a base, an emitter and a collector, the collector-emitter path connected across said heating coil, and a voltage divider connected in parallel with said pilot evaluating means and having a tap connected to said base of said limiting transistor for controlling the current applied to said heating coil, said control circuit further comprising an evaluating circuit connected to said pilot evaluating means and to said limiting transistor for feeding an additional current to said heating coil, said evaluating circuit including a first transistor circuit for evaluating the output voltage of said pilot evaluating means, a second temperature responsive resistor for sensing the environmental temperature of said feedback network, and a second transistor circuit connected to said first transistor circuit and to said second temperature responsive resistor and to said heating coil and controlled by said first transistor circuit and said second temperature responsive resistor to provide said additional current inversely proportional to the output voltage of said pilot evaluating means and inversely proportional to the environmental temperature sensed by said second temperature responsive resistor.

3,872,395

SIGNAL CONDITIONING CIRCUIT APPARATUS

Vard B. Holland, San Jose, Calif., assignor to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed May 5, 1971, Ser. No. 140,439
Int. Cl. H03f *1/36*
U.S. Cl. 330—86 **2 Claims**



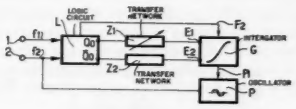
1. A signal conditioning circuit with a constant imput impedance and variable gain and offset comprising:
first and second input terminals;
first and second output terminals;
an operational amplifier with first and second inputs and an output;
said second input terminal, said second amplifier input and said second output terminal being commonly connected;
a resistor coupled between said first input terminal and said first amplifier input;
said amplifier output being coupled to said first output terminal;
means coupled between said amplifier output and said amplifier input for feeding back a signal, said feedback means including a variable resistance and a variable potential;
the gain of said signal conditioning circuit being a function of said resistance;
the offset of said signal conditioning circuit being independent of said gain and a function of said potential; and
said input impedance of said signal conditioning circuit being independent of said gain and said offset.

3,872,396

OSCILLATOR CONTROL CIRCUIT

Paul Bastide, Paris, and Robert Bonneton, Charenton, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Nov. 6, 1973, Ser. No. 413,350
Claims priority, application France, Nov. 6, 1972, 72.39206
Int. Cl. H03b *3/04*
U.S. Cl. 331—1 A **11 Claims**



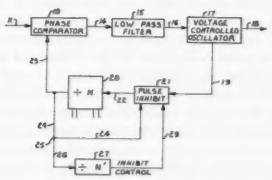
1. A control circuit for servo-controlling the frequency generated by a control oscillator in accordance with the frequency of a control signal, said circuit providing a phase-adjustable frequency control loop and comprising logic circuit means connected to receive said control signal and the output of said control oscillator for providing first and second rectangular complementary signals on respective outputs, an integrator circuit, and first and second transfer networks connecting the respective outputs of said logic circuit means to said integrator circuit, the output of said integrator circuit being connected in control of the frequency of said control oscillator, one of said first and second transfer networks having a variable impedance.

3,872,397

METHOD AND APPARATUS FOR DECREASING CHANNEL SPACING IN DIGITAL FREQUENCY SYNTHESIZERS

Charles K. Hanneman, Overland Park, Kans., assignor to King Radio Corporation, Olathe, Kans.

Filed Nov. 7, 1973, Ser. No. 413,616
Int. Cl. H03b *3/04*
U.S. Cl. 331—1 A **6 Claims**



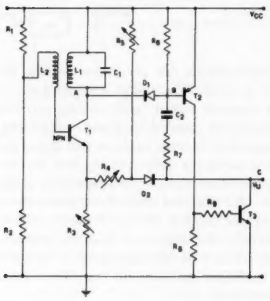
1. In a frequency synthesizer having a phase locked loop including a phase comparator that receives a reference frequency and compares it to a feedback frequency, delivers an output signal based on that comparison, and has a voltage controlled oscillator providing a frequency output based on the output of said phase comparator, and a digital divider electrically connected between said voltage controlled oscillator and said phase comparator for providing said feedback signal to said comparator, the improvement comprising
means for causing the digital divider to either divide by the divide ratios N or N′ thereby yielding an average ratio of $N_1 + N_2 + \ldots N_N + N'_1 + N'_2 + \ldots N'_M N''$ wherein N_1 through N_N, N'_1 through N'_M and N″ are integers and N″ equals M + N, said last mentioned means comprising
means for changing said divide ratios N to N′, and
means for averaging the divide ratios N and N′ by dividing the sum of $N_1 + N_2 \ldots N_N + N'_1 + \ldots N'_M$ by N″.

3,872,398

PROXIMITY SENSOR WITH ADJUSTABLE HYSTERESIS

Alfredo Fausone, Ivrea, and Luigi Piglione, Cirie, both of Italy, assignors to Ing. C. Olivetti and C., S.p.A., Ivrea (Torino), Italy

Filed Sept. 25, 1973, Ser. No. 400,631
Claims priority, application Italy, Oct. 11, 1972, 70194/72
Int. Cl. G08c 21/00; H03b 5/12
U.S. Cl. 331—65 2 Claims



1. A proximity sensor responsive to the relative change in location of a metal element comprising:

an oscillator circuit including an inductance for inductive coupling with the metal element, a transistor amplifier and a direct current voltage source for furnishing operating voltages to the elements of the transistor, the collector of said transistor being connected to one terminal of said voltage source through said inductance, a capacitor connected across said inductance, a first resistor voltage divider connected across said source and having an intermediate point connected to the emitter of said transistor to determine the emitter resistance of said transistor, a second resistor voltage divider connected across said voltage source, the base of said transistor being regeneratively coupled to said inductance and being connected to an intermediate point of said second voltage divider, said oscillator being operable to furnish an oscillating voltage output responsive to change in location of the metal element,

a demodulating stage connected to said oscillator to supply an output voltage of amplitude determined by the oscillating voltage output of the oscillator circuit, an output stage, each of said demodulating and output stages including a transistor, a first diode connected between the base of the demodulating transistor and the collector of the oscillator transistor, the base of the output transistor being connected to the collector of the demodulating transistor, a pair of output terminals respectively connected to the collector and emitter of the output transistor, and a regenerative feedback connection between the collector of the output transistor and the base of the demodulating transistor, and,

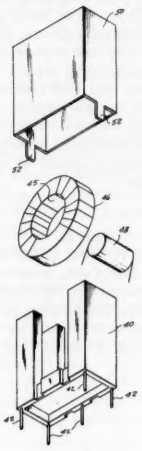
means for adjusting the sensitivity of said oscillator circuit to relative change in location of the metal element comprising at least one variable resistance element in said first voltage divider which establishes emitter resistance of said oscillator transistor.

3,872,399

MODULAR L-C FILTER

Vincent P. Friberg, Longmeadow, Mass., and John Chesney, Roselle Park, N.J., assignors to General Instrument Corporation, Clifton, N.J.

Filed Apr. 12, 1974, Ser. No. 460,274
Int. Cl. H03h 7/02, 7/08
U.S. Cl. 333—70 S 7 Claims



1. An L-C circuit comprising a core in the shape of a toroid substantially surrounding an opening, a conductor, said conductor being wound around said core a given number of turns to define a winding, and a capacitor physically situated within the opening associated with said core and electrically connected to said conductor to form a portion of a turn around said core.

3,872,400

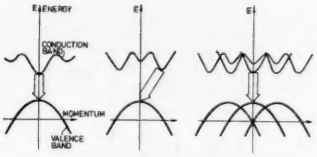
SEMI CONDUCTOR LASER

Karl Glausecker, Oberkirchberg, and Uwe Gnutzmann, Ulm-/Donau, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt/Main, Germany

Filed July 28, 1972, Ser. No. 276,162
Claims priority, application Germany, Aug. 6, 1971, 2139436
Int. Cl. H01s 3/18; H01l 3/12
U.S. Cl. 331—94.5 H 18 Claims

1. A semiconductor laser comprising a semiconductor body formed of a material having an indirect optical transition between its conduction band and its valence band and having at least a portion which is constructed to displace an absolute secondary minimum of its conduction band to the absolute

maximum of its valence band to achieve direct optical transitions, and pumping means for applying energy to said semiconductor body to induce the emission of light from said semiconductor body.

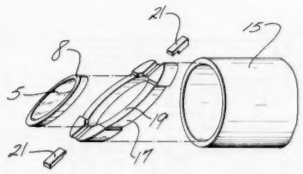


3,872,401

LASER ASSEMBLY INCLUDING A CRYSTALLINE LASER DISC WITH AN ANNULAR GLASS COATING

Richard F. Cooley, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 8, 1974, Ser. No. 431,798
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 E **9 Claims**



1. A crystalline laser disc having an annular lead borate glass coating capable of absorbing energy at the lasing wavelength to thereby absorb parasitic oscillations, the glass coating having an index of refraction not less than the index of refraction of the crystalline disc, the thermal expansion and contraction of the coating being sufficiently compatable with the disc to prevent the development of an undesirable stress level therein; the glass coating including barium oxide and Al_2O_3 and an effective amount of copper oxide that absorbs energy at a wavelength of about **1.06** microns.

8. A laser assembly comprising:

means for providing a source of pumping light;

means for defining a cavity having a lasing material including a housing;

means for holding a crystalline laser disc within the housing;

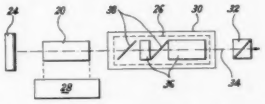
a crystalline laser disc located within the housing for causing stimulated emission; the disc having an annular coating; the coating comprising a lead borate glass capable of absorbing energy at the lasing wave length to thereby absorb any parasitic oscillations, the glass coating having an index of refraction not less than the index of refraction of the crystalline disc, the thermal expansion and contraction of the coating being sufficiently compatable with the laser disc so as to prevent the development of undesirable stresses in the disc, the glass coating including an effective energy-absorbing amount of copper oxide that absorbs energy at the lasing wave length.

3,872,402

LASER GENERATOR HAVING A REDUCED EMISSION SPECTRUM

Francis Sanchez, Yerres, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Sept. 20, 1973, Ser. No. 399,265
Claims priority, application France, Oct. 6, 1972, 72.35619
Int. Cl. H01S *3/08*
U.S. Cl. 331—94.5 **11 Claims**



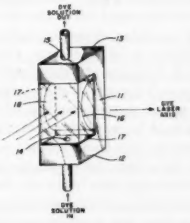
1. A laser generator having a reduced emission spectrum and comprising a suitably excited active medium placed within a resonator, wherein said resonator is constituted by a mirror having a high coefficient of reflection and by a selective reflector assembly comprising a plurality of plates having parallel faces cut in a birefringent material in a direction parallel to the optical axis, said plates as well as their neutral lines being parallel to each other, each plate being preceded by a polarizer in which the direction of polarization makes an angle of 45° with said neutral lines.

3,872,403

TRANSVERSE LAMINAR FLOW DYE LASER CELL

Herschel S. Pilloff, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 286,783, Sept. 6, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 447,456
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **2 Claims**



1. A transverse laminar flow dye laser cell for the nitrogen laser, which comprises:

a housing;
said housing including a base with opposite ends perpendicular with said base;
a dye solution inlet in one end,
a dye solution output in the opposite end;
opposite side windows secured to said base and opposite ends;
a top window enclosing said housing;
a somewhat elliptical form within said housing blocking off a major portion of said cell with the greatest height of said form near the top window thereby restricting the fluid flow passage between said form and said top window and forming a line parallel with said ends while preventing turbulence.

3,872,404

SQUARE WAVE TRANSISTOR RELAXATION OSCILLATOR

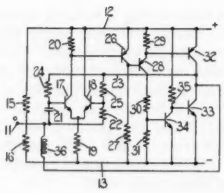
Christopher Robin Jones, Solihull; Malcolm Williams, Somerset, and Geoffrey Albert Kenyon Brunt, Alcester, all of England, assignors to C.A.V. Limited, Birmingham, England

Filed Apr. 4, 1973, Ser. No. 347,723

Claims priority, application United Kingdom, Apr. 4, 1972, 15342/72; Apr. 4, 1972, 15343/72

Int. Cl. H03k *3/28*

U.S. Cl. 331—111 **5 Claims**



1. A square wave oscillator which is driven between a first state and a second state and which includes first and second d.c. supply lines, a third supply line which is maintained at a potential between the potential of the first and second supply lines, a resistor-capacitor network, and switch means which when the oscillator is in one state connects the resistor-capacitor network between the third and first supply lines to determine the period for which the oscillator remains in said one state, the switch means serving when the oscillator is driven to its second state to connect the resistor-capacitor network between the third and second supply lines to determine the period for which the oscillator remains in its second state, said resistor-capacitor network being connected between the switch means and the third supply line and including two parallel circuits, one containing a pair of resistors in series, and the other containing a resistor and a capacitor in series, the junction of the pair of resistors, and the junction of the resistor and capacitor, providing two inputs to a comparator which controls the switching means.

3,872,405

N-GATE THYRISTOR OSCILLATOR HAVING A PARALLEL CIRCUIT OPERABLE AS A CONSTANT CURRENT CIRCUIT WHEN THE THYRISTOR IS CONDUCTIVE

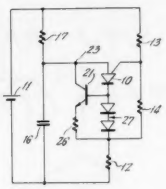
Toshiaki Gotou, and Ryuichi Saijo, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 15, 1974, Ser. No. 451,360

Claims priority, application Japan, Mar. 31, 1973, 48-37056

Int. Cl. H03k *3/35*

U.S. Cl. 331—111 **5 Claims**



1. A relaxation oscillator including an N-gate thyristor having an anode, a cathode, and a gate electrode, means for biassing said gate electrode to a predetermined gate potential, a capacitor, means for charging said capacitor to develop a voltage thereacross, and means for supplying said voltage to said anode to develop an anode potential at said anode and to render said thyristor conductive when said anode potential exceeds said gate potential, wherein the improvement comprises a parallel circuit between said anode and cathode, said circuit being operable as a constant current circuit when said thyristor is rendered conductive.

3,872,406

METHOD AND APPARATUS FOR LINEARIZING THE CHARACTERISTIC OF A SWEEP FREQUENCY GENERATOR

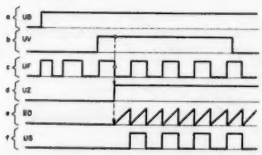
Wilhelm Grafinger, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 24, 1973, Ser. No. 400,326

Claims priority, application Germany, Sept. 27, 1972, 2247277

Int. Cl. H03b *23/00*

U.S. Cl. 331—178 **10 Claims**



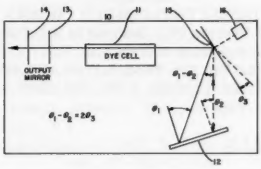
1. A method for maintaining a linear frequency-time characteristic for a variable frequency oscillator controlled by a sweep generator, comprising the steps of producing a first pulse train having a pulse repetition rate proportional to the present slope of said characteristic, producing a second train of pulses having a pulse repetition rate proportional to the desired slope of said frequency-time characteristic and equal to the pulse repetition rate of the first pulse train when the present slope corresponds to the desired slope, comparing the first pulse train with the second pulse train, deriving a control

voltage from said comparison, and employing said control voltage to control the operation of said sweep generator.

3,872,407
RAPIDLY TUNABLE LASER

Richard Swart Hughes, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 1, 1972, Ser. No. 287,113
Int. Cl. H01s *3/05, 3/10*
U.S. Cl. 332—7.51 **8 Claims**

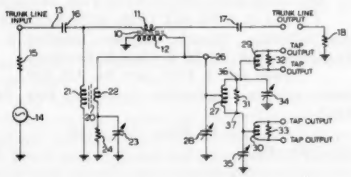


1. A rapidly tunable laser comprising;
a laser cavity having an output mirror as a front element;
a dispersive means fixedly mounted with respect to the laser path as a back reflective element;
laser means positioned within said cavity for outputting a laser beam of a given wavelength and being adapted to be tuned across a given bandwidth;
tuning means optically and movably positioned between said laser and said dispersive means so that it may be driven to cause a physical movement thereof and a corresponding movement of the laser beam;
said dispersive means being positioned with respect to said tuning means so that when the tuning means is driven the laser beam is scanned across the fixed dispersive means thereby causing the output wavelength of the laser to change dependent upon the amount of scan.

3,872,408
SIGNAL DIRECTIONAL TAP

James Park Reilly, Lindsay, Ontario, Canada, assignor to Lindsay Specialty Products Limited, Lindsay, Ontario, Canada

Filed May 3, 1974, Ser. No. 466,664
Int. Cl. H03h *7/48*
U.S. Cl. 333—10 **9 Claims**



1. In a directional tap for tapping electronic signals from a distribution or transmission line and supplying the tapped signals to at least one subscriber, said directional tap including a directional coupler means having a current sensing transformer and a voltage sensing transformer wherein said current transformer has a primary winding connected in said distribution line and said voltage sensing transformer has a primary winding connected in shunt across said distribution line, the secondary windings of the sensing transformers being connected in parallel, the improvement comprising said current sensing transformer having a turns ratio of

$$\frac{\text{primary winding (current)}}{\text{secondary winding (current)}} = \frac{1}{N \cdot r}$$

and said voltage sensing transformer having a turns ratio of

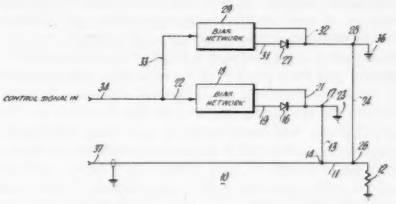
$$\frac{\text{primary winding (voltage)}}{\text{secondary winding (voltage)}} = \frac{N}{1}$$

wherein N is the number of windings and r is the ratio Z/z in which
z is the characteristic impedance of said distribution or transmission line and
Z is a selected output impedance of said coupler means, and $Z \quad z$.

3,872,409
SHUNT LOADED LINE PHASE SHIFTER

Leonard Hatkin, Elberon, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 30, 1974, Ser. No. 465,450
Int. Cl. H01p *1/18*; **H03h** *7/18*
U.S. Cl. 333—31 R **10 Claims**

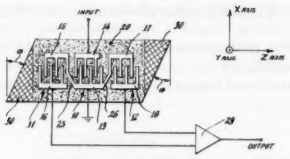


1. A differential phase shifter having a center operating frequency and including:
a main transmission line having a characteristic admittance of Y_0;
a first shunt transmission line stub having a characteristic admittance of Y_1; said first shunt transmission line stub having a first end connected to said main transmission line at a predetermined location;
means for selectively shorting said first shunt transmission line stub at a location spaced from said first end thereof by a distance of θ_1 at said center operating frequency;
means for shorting said first shunt transmission line stub at a location spaced from said first end thereof by a distance of $(\theta_1+2\phi_1)$ where $(\theta_1+\phi_1)$ is 90° at said center operating frequency;
a second shunt transmission line stub having a characteristic admittance of Y_2; said second shunt transmission line stub having a first end connected to said main transmission line at a location spaced from said predetermined location by 90° at said center operating frequency;
means for selectively shorting said second shunt transmission line stub at a location spaced from said first end thereof by a distance of θ_2 at said center operating frequency.
means for shorting said second shunt transmission line stub at a location spaced from said first end thereof by a distance of $(\theta_2+2\phi_2)$, where $\theta_2+\phi_2)$ is 90° at said center operating frequency; and the following relationship is satisfied:
$Y_1 \operatorname{Cot} \theta_1/Y_0 = Y_2 \operatorname{Cot} \theta_2/Y_0 /[1 + (Y_2^2 \operatorname{Cot}^2\theta_2/Y_0^2)]$.

3,872,410
SURFACE WAVE FILTER FOR TV IF STAGE

Joseph Zucker, Peabody, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 312,080, Dec. 4, 1972, abandoned. This application Jan. 11, 1974, Ser. No. 432,704
Int. Cl. H03h 9/02, 9/26, 9/32
U.S. Cl. 333—72 15 Claims

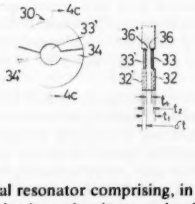


1. A solid state filter comprising:
a. an acoustic surface wave propagating medium;
b. an input transducer having upper and lower interleaved combs of electrodes, the number, size and spacing of said electrodes being selected for predetermined trap frequencies, and responsive to an applied signal for launching bi-directional surface waves in said medium; and
c. two output transducers each having upper and lower interleaved combs of electrodes, the number size and spacing of said electrodes being selected for predetermined trap frequencies, said output transducers symmetrically arranged about said input transducer coupled to a second and third portion of said medium and responsive to said bi-directional acoustic surface wave launched therein for producing two output signals which are 180° out of phase, said lower comb of said input transducer is electrically connected to ground potential and to both of said upper combs of said output transducers, and said output transducers have the same number of electrodes and said input transducer has three halves times the number of electrodes of either output transducer.

3,872,411
QUARTZ CRYSTAL RESONATOR AND A METHOD FOR FABRICATION THEREOF

Takao Watanabe; Akira Kohchi, and Toshinobu Fujii, all of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Nov. 10, 1972, Ser. No. 305,363
Claims priority, application Japan, Nov. 17, 1971, 46-92274
Int. Cl. H03h 9/18; H01v 7/00; H04r 17/10
U.S. Cl. 333—72 7 Claims



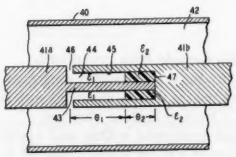
1. A quartz crystal resonator comprising, in combination, a quartz crystal plate having a density ρ_1 and a thickness t_1, said quartz crystal plate having a first major surface formed with a recess of depth δ_t, said first recess having a central portion and an elongated portion extending from said central portion and terminating at the perimeter of said first major surface, said quartz crystal plate further having a second major surface parallel to said first major surface and formed with a second recess having a depth substantially equal to the depth of said first recess, said second recess having a central portion in registry with said central portion of said first recess and an elongated portion extending from said central portions in a direction opposite to the direction of said elongated portion of said first recess, said second recess terminating at the perimeter of said second major surface; and first and second electrode layers respectively placed in said first and second recesses and having substantially the same thickness t_2 and the same density ρ_2, said depth of said first and second recesses, said thickness of said electrode layers, and said densities satisfying the inequality:

$$\delta t > \rho_2/\rho_1 \, t_2.$$

3,872,412
DIELECTRIC-LOADED CHOKES

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 26, 1974, Ser. No. 464,479
Int. Cl. H01p 1/20, 3/06, 7/04
U.S. Cl. 333—73 R 12 Claims

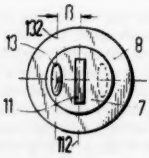


1. A dielectric-loaded choke comprising:
a length of transmission line open circuited at its input end and reactively terminated at its other end;
a first region of said line, adjacent to the input end, being loaded by means of a first dielectric material having a dielectric constant ϵ_1;
a second region of said line, constituting the remaining portion of said line, being loaded by means of a second dielectric material having a second dielectric constant ϵ_2, where ϵ_2 and ϵ_1 are unequal;
the parameters of said choke, including the lengths of said two regions, and the magnitudes of ϵ_1 and ϵ_2, being proportioned to produce an input impedance to said choke that is much different at one frequency than it is at a second frequency where said two frequencies are harmonically related.

3,872,413
METHOD AND APPARATUS FOR TUNING COAXIAL-LINE SECTION RESONATORS

Guenter Schneider, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 5, 1973, Ser. No. 321,329
Claims priority, application Germany, July 24, 1972, 2236168
Int. Cl. H01p 7/04, 1/00
U.S. Cl. 333—82 B 8 Claims



1. A coaxial line section resonator comprising: a coaxial line section having one end short-circuited by a conductive plate,

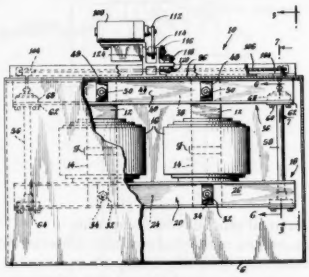
an electrically conductive field displacement body supported in the space between the conductors of said coaxial line section near said conductive plate, said field displacement body being formed integrally with a rotatable member extending from the exterior of said resonator into the space between the conductors of said coaxial line section, said field displacement body being a relatively flat body, and a second field displacement body mounted on said rotatable member, the major plane of said second field displacement body being parallel to that of the first field displacement body, said second field displacement body being arranged eccentrically to the axis of rotation of said rotatable member.

3,872,414

MOBILE, ACCURATELY MECHANICALLY VARIABLE HIGH REACTIVE POWER INDUCTOR HAVING LOW HEADROOM REQUIREMENTS SUITABLE FOR TRANSPORT ON A UTILITY VEHICLE

Richard F. Schutz, Brewster, N.Y., assignor to Hipotronics, Inc., Brewster, N.Y.

Filed Oct. 12, 1973, Ser. No. 405,840
Int. Cl. H01f *21/06*
U.S. Cl. 336—134 **5 Claims**



1. A mobile, accurately mechanically variable high reactive power inductor of the type having a magnetic core and an electrical winding magnetically coupled to the core, the magnetic core being in the form of upper and lower separable core segments separated by a gap, said high reactive power inductor being compact and suitable for transport on a utility vehicle such as a truck, railroad car or the like to a remote field location for testing large capacitive loads such as large capacitors, a group of capacitors, high voltage electrical power transmission lines, and the like, said mobile high reactive power inductor comprising:

rigid lower frame means for supporting the lower core segment and the electrical winding magnetically coupled to the core,

rigid upper frame means reciprocally mounted with respect to said lower frame means for supporting said upper core segment, the upper core segment thus being aligned with the lower core segment and the electrical winding and being vertically movably suspended above the lower core segment,

linearly telescoping jack means associated with said upper and lower frame means for vertically reciprocally positioning said upper frame means above said lower frame means and, hence, for vertically reciprocally positioning the upper core segment above the lower core segment to control the gap size between the upper and lower core segments, said linearly telescoping jack means including a plurality of spaced jacks mounted between said upper frame means and said lower frame means, each jack comprising:

a rigid outer tubular body;

a rigid inner tubular body slidably, reciprocally mounted within said outer tubular body for telescoping movement into and out of said outer tubular body;

packing means associated with said inner and outer tubular bodies for preventing relative horizontal movement thereof,

jack extension means for variably adjustably moving said inner tubular body out of and into said outer tubular body in telescoping fashion to variably, adjustably increase and decrease the total length of said jack,

for rigidly maintaining the alignment of the upper and lower core segments and the electrical winding magnetically coupled to the segments throughout the vertical range of travel of said telescoping jack means irrespective of vibration and other generally random horizontal and vertical motion which said high reactive power inductor may experience during field transport, and

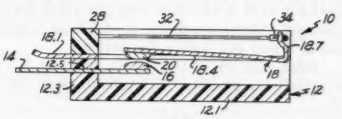
means for driving said linearly telescoping jack means to reciprocally move said upper frame means and said lower frame means to adjust the gap size between the upper and lower core segments whereby said high reactive power inductor may be operated upon a vehicle while the core segments and electrical winding are maintained in aligned relation.

3,872,415

RELAY

David E. Clarke, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 16, 1973, Ser. No. 351,750
Int. Cl. H01h *61/06*
U.S. Cl. 337—140 **7 Claims**

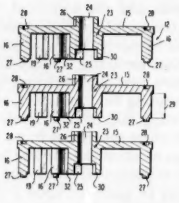


1. A relay comprising electrically insulating base means, a first conductive member mounted on said base means, a second conductive member formed of a single sheet of electrically conductive sheet material having a pair of spaced first portions secured to said base means, having a contact arm portion extending in cantilever relation from the remainder of said second member between said first portions of said second member and movable at its distal end between an open circuit position spaced from said first conductive member and a closed circuit position engaging said first conductive member, and having spring means integrally formed in said sheet material respectively connecting said first member portions with an opposite end of said contact arm portion of said second conductive member and normally biasing said contact arm portion to one of said circuit positions, and an actuator wire element secured between said opposite end of said contact arm portion and said base means, said actuator element being formed of a metal alloy adapted to be deformed from an original configuration to a second configuration as said contact arm portion is moved to said one circuit position by said spring bias while said metal alloy displays a relatively low modulus of elasticity below a transition temperature and to abruptly return to said original configuration and to display a relatively higher of elasticity to move said contact arm portion to the other of said circuit positions against said spring bias when said metal alloy is heated above said transition temperature.

3,872,416
FUSE ARRANGEMENT, ESPECIALLY FOR MOTOR VEHICLES

Norbert Kinasi, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuggart-Untertuerkheim, Germany

Filed May 22, 1972, Ser. No. 255,634
Claims priority, application Germany, May 22, 1971, 2125439
Int. Cl. H01h 85/02
U.S. Cl. 337—201 85 Claims

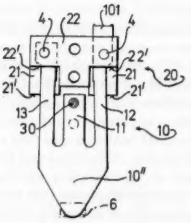


1. A device for the arrangement of fuses, especially in motor vehicles, which includes a fuse carrier means, fuses exchangeably arranged in said fuse carrier means, and cable connection means, characterized in that a separate receptacle means is coordinated to said fuse carrier means, which contains the cable connection means, said fuse carrier means being insertable into said receptacle means, and said fuse carrier means being lockable in a position in the receptacle means in which the fuses are electrically connected with the corresponding cable connection means.

3,872,417
SNAP-ACTION SWITCH FOR A THERMAL TRIGGER, ESPECIALLY FOR A MOTOR PROTECTION DEVICE

Max Hufschmid, Niedererlinsbach, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Aug. 29, 1973, Ser. No. 392,784
Claims priority, application Switzerland, Sept. 26, 1972, 14021/72
Int. Cl. H01h 37/54
U.S. Cl. 337—365 1 Claim

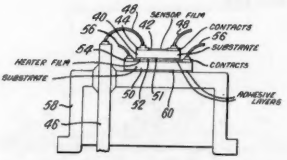


1. A snap-action switch for a thermal trigger mechanism, especially for a motor protection device, comprising rest contacts, an elastic spring, which can be actuated by a bimetallic element for opening the contacts, at least one of the rest contacts being stationarily arranged and at least one being mounted at the elastic spring, a stop movable into the path of the elastic spring in front of its dead-center position, the improvement wherein said elastic spring comprises a substantially E-shaped spring member having a pair of outer legs and a central leg, two stationarily mounted support plates for fixedly retaining the E-shaped spring member at the ends of both of its outer legs, means for pre-biasing said outer legs towards one another substantially in the plane of the spring member, one of the support plates which is closer to said at least one stationary contact being constructed to extend along both of the outer spring legs to a position which is closer to said at least one contact mounted at the elastic spring member than is the other support plate, said central leg having a free end and moving with said free end past the support plates under the action of the bimetallic element, said spring member having a spring web carrying said at least one contact mounted thereat and said spring web being enlarged in size at the side facing away from said legs, said stop being movable into the path of said spring web.

3,872,418
ELECTRICAL RELAY DEVICE

Charles T. Plough; H. Keith Eastwood, both of Beaconsfield, and Marcus Arts, Longueuil, Quebec, all of Canada, assignors to Multi-State Devices Ltd., Dorval, Province of Quebec, Canada

Filed Jan. 7, 1974, Ser. No. 431,428
Int. Cl. H01c 7/04
U.S. Cl. 338—23 9 Claims



1. An electrical relay device comprising:
a. a first substrate of thermal insulative material mounted on a suitable heat conductive support;
b. a heater film deposited on said first substrate;
c. first electrical contacts mounted on said first substrate and connected to said heater film for connecting said heater film to a source of control voltage;
d. a second substrate having a mass smaller than said first substrate mounted on top of said heater film;
e. a thin film of a sensing material exhibiting a large change of impedance at a critical temperature deposited on said substrate, said second substrate being made of a single crystal material selected to optimize the electrical properties of the sensing material deposited thereon; and
f. second electrical contacts mounted on said second substrate and connected to said thin film of sensing material for connecting it to the terminals of a control circuit.

3,872,419
ELECTRICAL ELEMENTS OPERABLE AS THERMISTERS, VARISTERS, SMOKE AND MOISTURE DETECTORS, AND METHODS FOR MAKING THE SAME

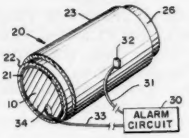
Alexander J. Groves, 2625 Park Ave., Bridgeport, Conn. 06604, and Alexander J. Groves, Jr., 596 Tollsome Hill, Fairfield, Conn. 06430

Filed June 15, 1972, Ser. No. 263,192
Int. Cl. H01c 7/00, 13/00
U.S. Cl. 338—25 28 Claims

1. An electrical element comprising:
A) a metal substrate;
B) a layer of nickel aluminide deposited on the metal substrate;
C) a layer of ceramic semiconductor material comprising aluminum oxide and titanium oxide deposited on the

layer of nickel aluminide and

D) a layer of conductive material forming an electrical



terminal deposited on the layer of ceramic semiconductor material.

3,872,420
ROTARY POTENTIOMETER

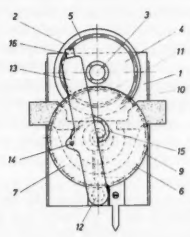
Dieter Koch, Escherde, and Peter-Josef Graf, Hildesheim, both of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed Jan. 24, 1974, Ser. No. 436,209

Claims priority, application Germany, Feb. 16, 1973, 2307680

Int. Cl. H01l *9/02*

U.S. Cl. 338—162 **4 Claims**



1. In a rotary potentiometer having a drive wheel of the peg-toothed crown gear type, engaged with an approximately one-turn spiral ridge provided on a control wheel in the outer part of a disc surface thereof, said drive wheel and the potentiometer arm being rotatably mounted slightly askew to the control wheel on a carrier plate on which said control wheel is also rotatably mounted, so that by the engagement of said control wheel and said drive wheel one revolution of said control wheel will rotate said drive wheel by one tooth, said teeth of said drive wheel being in the form of evenly spaced pegs over part of the periphery of said drive wheel, the improvement which is that the electrical portion of the rotary potentiometer comprises:

a resistance element consisting essentially of a substantially semicircular segment of an annular disc, including an exposed layer of resistance material, with the legs thereof extended to form outwardly extended contact tabs provided with a metallized contact surface, said resistance element being seated on said carrier plate approximately parallel to the disc of said drive wheel with its tabs extending respectively beyond opposite edges of said carrier plate;

central connection lug means seated on said carrier plate and having an annular disc portion concentric with and within the semicircular segment of said resistance element and providing an annular contact surface and having also a strip portion extending away from said annular portion and at least for part of its length seated in a channel in said carrier plate so as to pass under said semicircular portion of said resistance element without contact therewith and providing a connection lug in the neighborhood of its extremity, and

wiper means affixed to said drive wheel for making contact with said annular contact surface of said central connection lug means and with said resistance element.

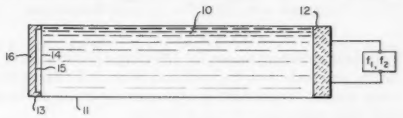
3,872,421
STANDING WAVE ACOUSTIC PARAMETRIC SOURCE

Peter H. Rogers, Reston, and Arnie Lee Van Buren, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 316,605, Dec. 19, 1972, abandoned. This application Oct. 19, 1973, Ser. No. 408,038

Int. Cl. H04b *13/00*

U.S. Cl. 340—10 **5 Claims**



1. A device for producing omnidirectional, low frequency acoustic waves, which comprises:

a thin wall acoustic waveguide having a first and second open end;

a transducer secured to said first open end of said waveguide;

a plug of pressure release material closing said second open end of waveguide to form a resonant cavity;

a fluid filling said acoustic waveguide between said transducer and said pressure release material;

a first and second high intensity, high frequency signal producing means connected with said transducer for simultaneous operation thereof producing first and second high intensity, high frequency standing waves within said resonant cavity;

said first standing wave having a frequency higher than said second standing wave;

said pressure release material inhibiting the growth of sum frequencies and harmonics whereby a low frequency output wave is generated by a nonlinear interaction of the two high frequency standing waves in the fluid within said waveguide, and

said wall thickness is sufficiently thin that said wall is transparent to said low frequency while reflecting said first and second high frequency signals.

3,872,422
STREET TRAFFIC SIGNALLING SYSTEM

Anton Obermaier; Peter Drebinger, both of Munich, and Johann Hoisl, Ottobrunn, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 13, 1973, Ser. No. 369,725

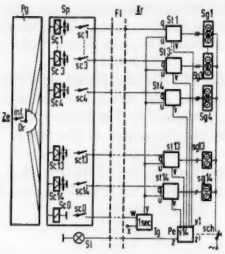
Claims priority, application Germany, June 15, 1972, 2229284

Int. Cl. G08g *1/07*

U.S. Cl. 340—41 R **3 Claims**

1. In a street traffic signalling system in which the signal light units for the traffic flow in each direction at an intersection are independently regulated under the control of a central programmer at a main station with the signal unit for each such traffic flow being controlled over a respective individual channel, the combination of an actuating switch, controlled by said programmer, for each channel at such main station, operative to transmit order signals to the associated unit, time switches, for the respective units, in the form of impulse counters adapted to be triggered in response to an order signal resulting from actuation of the cooperable actuating switch, a timing generator connected in common to the respective impulse counters of an intersection for supplying impulses thereto, said timing generator being connected to receive

synchronizing impulses, from the main station, at selected time intervals, whereby such generator is periodically synchronized, for example, once per signalling cycle, said timing

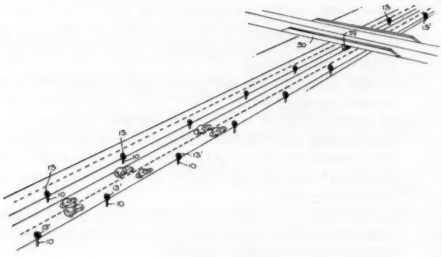


generator including means for effecting a phase-shifting of the timing impulses upon the initiation of an order signal from the main station, for preventing improper operation of the system and false indications in a test device.

3,872,423
VEHICLE PACER SYSTEM AND A METHOD OF SPACING MOVING VEHICLES ALONG A TRAFFIC LANE OF A ROADWAY

John Yeakley, Neptune, N.J., assignor to American Enterprise of Charlotte, Inc., Neptune, N.J.

Filed June 27, 1973, Ser. No. 373,918
Int. Cl. G08g *1/09*
U.S. Cl. 340—43 **17 Claims**



1. In a vehicle pacer system for spacing immediately successive vehicles apart in a traffic lane of a roadway,

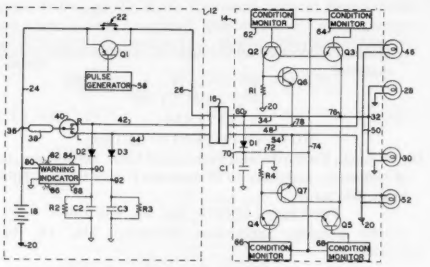
a series of signal indicating means disposed along the traffic lane in equal spacings relative to each other, said spacing (s) corresponding to a distance equal to a multiple of vehicle length for a given speed (v) and each means having at least two indicators for visual display and a radio receiver for receiving a first signal to visually display one of said indicators and for permitting visual display of another of said indicators in response to an absence of said first signal; and

a radio transmitter remotely located with respect to said series of signal indicating means for emitting said signal simultaneously to said radio receiver of each signal indicating means repeatedly at time intervals (t) to obtain an alternating visual display of said indicators in each signal indicating means and to obtain a visual display of said one indicator at each successive signal indicating means in a continuous corresponding to said given speed for a vehicle travelling along the traffic lane, said time intervals (t) being determined by dividing said spacing (s) in feet by said given speed (v) in feet per second, whereby successive continuous sequences of visual display of said one indicator by said series of signal indicating means enables immediately successively travelling vehicles to be spaced apart in the traffic lane at said spacing (s) of said signal indicating means.

3,872,424
APPARATUS AND METHOD FOR TRANSMITTING AUXILIARY SIGNALS ON EXISTING VEHICLE WIRING

Robert S. Enabnit, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 12, 1973, Ser. No. 406,076
Int. Cl. G08c *15/12*
U.S. Cl. 340—52 F **16 Claims**



1. In combination with a vehicle electrical system including a plurality of n individual circuits, apparatus to effect power and information communication between a remote condition monitoring circuit and a warning indicator using the circuit wiring for the n individual circuits comprising:

a. a pulse generator coupled to a first of the n individual circuits to provide short duration voltage pulses of insufficient average power to affect normal circuit operation;

b. circuit means coupling the remote condition monitoring circuit to the first of the n circuits to accumulate the pulses and provide a continual source of DC power to the monitoring circuit;

c. a gating circuit intercoupling the remote monitoring circuit, the first of the n circuits, and a second of the n circuits, to gate pulses from the first of the n circuits to the second of the n circuits in response to the output of the remote monitoring circuit; and

d. circuit means coupling the warning indicator to the second of the n circuits to detect the presence of pulses and provide an input signal to the warning indicator indicative of the monitored condition as reflected in the presence or absence of pulses.

3,872,425
OPERATION INDICATING DEVICE FOR HYDRAULIC BRAKE SYSTEM

Ikuya Kobayashi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan

Division of Ser. No. 249,769, May 3, 1972, Pat. No. 3,828,308.
This application Feb. 5, 1974, Ser. No. 439,714
Claims priority, application Japan, Oct. 13, 1971, 46-80792
Int. Cl. B60t *17/22*
U.S. Cl. 340—52 C **1 Claim**

1. A device for indicating troubles within an automobile hydraulic brake system having a master cylinder, wheel brake cylinders and hydraulic braking circuits to connect said master cylinder with said wheel brake cylinder, comprising:

an electric source

a key switch;

a pilot lamp located at a convenient place;

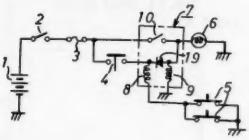
contact means for selectively connecting said source to said lamp through said key switch;

normally closed pressure switch means disposed within said braking circuits to be opened in response to a pressure

value at or over a predetermined one within said braking circuits;

brake switch means normally opened and operable with a foot brake pedal on which stepping causes closing of said brake switch means, said closing being conducted after opening of said pressure switch means in normal operation thereof when pressure of said predetermined value is produced within said braking circuits;

relay means including a first coil thereof energized by closing of said brake switch means with said pressure switch means remaining extraordinarily closed, a second coil thereof wound in an opposite direction against said first coil on an iron core on which said first coil is wound, and



means including contacts interposed between said first and second coils and interlocked with said contact means for blocking current supply to said coil through said first coil, solo-energization of said first coil closing said contact means to light said pilot lamp, solo-energization of said second coil opening said contact means to turn off said pilot lamp and energization of both coils at a time with said contact means closed offsetting magnetic power generated respectively by said first and second coils to cause no effect on said contact means so as to let said pilot lamp remain lighted; and

bi-stable locking means operated by energization of either of said coils to maintain the closed or open position of said contact means.

3,872,426

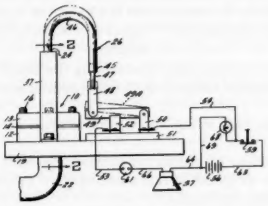
AUDIBLE EMERGENCY WARNING SIGNAL DEVICE FOR AN AIR BRAKE SYSTEM

Lewis E. Greenwald, 44 Logan St., and Carl V. Greenwald, 236 W. Eight St., both of Peru, Ind. 46970

Filed Jan. 17, 1974, Ser. No. 434,016

Int. Cl. G08b *21/00*

U.S. Cl. 340—52 C **2 Claims**



1. A warning device for an air brake system which comprises a diaphragm housing having a diaphragm cavity, a diaphragm mounted in the housing for movement in said cavity, means for connecting a main air line of the brake system to the housing in communication with the cavity on one side of the diaphragm, pressure in the line urging the diaphragm against one side of the cavity, an actuator member attached to the diaphragm and extending outwardly of the housing on the side of the diaphragm remote from the air line, a yoke overlying the housing, the actuator extending through an opening in the yoke, a compression spring mount on the actuator outside the housing and engaging the yoke, means on the actuator engaging the spring so that the spring urges the actuator member in a direction to advance the diaphragm to the other side of the cavity when the pressure in the line falls below a predetermined pressure, a switch connected to the actuator to be actuated when the diaphragm moves across the cavity, and an audible warning signal means connected to the switch to be actuated when the diaphragm is at the other side of the cavity to give an audible warning signal when the pressure in the line falls below the predetermined pressure.

3,872,427

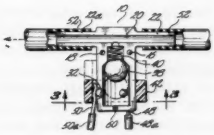
MOTOR VEHICLE LIGHT GUARD

Richard L. Carlson, P.O. Box 680, and William L. Richardson, 33023 56th South, both of Auburn, Wash. 98002

Continuation of Ser. No. 301,709, Oct. 30, 1972,. This application Mar. 5, 1974, Ser. No. 448,332

Int. Cl. B60q *1/00*

U.S. Cl. 340—52 D **7 Claims**



1. An improved device for use on a motor vehicle to sound an alarm if the vehicle's lights are on while the motor is off, said device being used in combination with a motor vehicle, vehicle lights, motor vehicle vacuum and an alarm wherein the improvement comprises: a tee shaped housing to include a pair of non-conductive molded parts joined together, said housing having a hollow trunk and communicating hollow laterally extending arms, and said trunk having a plurality of openings; a plurality of electrodes extending through the openings, said electrodes comprisng conductive balls extending partly inside and partly outside the housing; a non-conductive ring having interior tapered slots spaced to hold the electrodes in the openings; a conductive ball movable within the hollow trunk and contacting the electrodes; means for communicating between the hollow trunk and the motor's vacuum system to allow the vacuum to move the ball away from the electrodes; means for connecting a first electrode to the alarm; and means for connecting a second electrode to the vehicle lights.

3,872,428

ADJUSTABLE LAMPHOLDER WITH ARTICULATED SWIVEL MOUNT

Roger L. Boisvert, Blackstone, Mass., assignor to General Electric Company, New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,191

Int. Cl. F21v *21/08*

U.S. Cl. 240—52.1 **4 Claims**

1. A lampholder comprising,

a. an insulating lamp housing having two half shells,

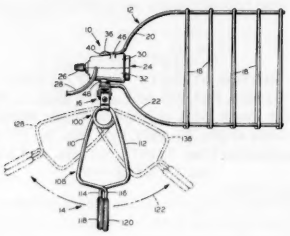
b. a lamp guard,

c. forked attachment means extending from said lamp guard for attachment at each side of said lamp housing, said attachment means comprising a pair of tines, each having a hole therein;

d. lampholder mounting means,

e. and an articulated swivel joint between the mounting means and housing,

f. said articulated swivel joint including a clevis having its bight portion proximate one of the tines of said guard,
g. said clevis having a hole at the bight portion and said hole being aligned with the hole of said one tine of said forked attachment means,
h. spring means between the clevis and the mounting means,
i. an eyelet extending through said aligned holes and



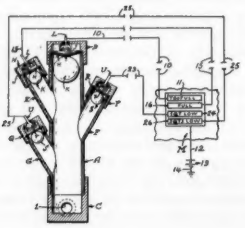
holding said one tine of said attachment means, said clevis and said spring means together under spring pressure to permit swiveling of said clevis relative to said one tine of said attachment means, and
j. an assembly rivet extending through the other tine of said attachment means, through said housing and through the eyelet to hold said housing assembled and to hold said lamp guard to said housing.

3,872,429

OIL LEVEL INDICATING DEVICE FOR A CRANKCASE OR TRANSMISSION

Thomas J. Arney, P.O. Box 2263, Castro Valley, Calif. 94546

Filed Sept. 10, 1973, Ser. No. 396,061
Int. Cl. B60q *1/00*; **G08b** *21/00*
U.S. Cl. 340—59 **4 Claims**



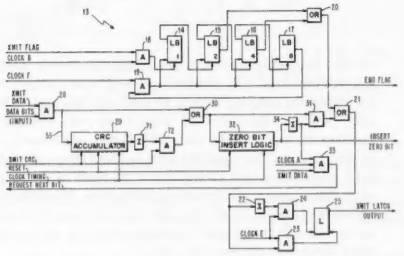
1. In combination:
a. a casing connectible to the oil pan of an internal combustion engine to receive oil therefrom, the casing being positioned on the oil pan so that the oil level in the oil pan will be the same as the oil level in the casing;
b. a first branch communicating with the casing at a lower elevation than the top of the casing;
c. a first float-controlled switch mounted in the upper end of said casing and a second float controlled switch mounted in the upper end of said first branch, said first switch closing an electric circuit to illuminate a first sign on the instrument panel, reading TOO FULL, when the oil level in said casing raises the float therein to actuate the switch, the communication of said first branch with the casing being at an angle to prevent said second float interfering with said first float in said casing;
d. said second switch closing an electric circuit to illuminate a second sign on the instrument panel, reading FULL, when the oil level in said casing and branch drops to a point where said first float-controlled switch opens but said second float-controlled switch remains closed.

3,872,430

METHOD AND APPARATUS OF ERROR DETECTION FOR VARIABLE LENGTH WORDS USING A POLYNOMIAL CODE

Paul Emile Boudreau, 18 Chipmunk Ln., Ridgefield, Conn. 06877; Wayne Donald Brodd, 5012 Hermitage Dr., Raleigh, N.C. 27612, and Robert Anderson Donnan, 1701 Curtis Rd., Chapel Hill, N.C. 27514

Filed Nov. 23, 1973, Ser. No. 418,351
Int. Cl. G06f *11/12*
U.S. Cl. 340—146.1 AL **6 Claims**



1. A digital data transmission system for variable length digital information fields separated by one or more unique flags;
said system comprising a transmitter and a receiver adapted to communicate over an error-prone communication medium;
said transmitter including an encoder for generating block check fields from said information fields which are represented by the polynomial $R'(X)$ in the equation

$$R'(X)=[\text{Remainder}\,(X^{n-k}\cdot G(X)+X^{k}K_1(X)/P(X))]+K_2(X)$$

where
$R'(X)$ is the polynomial representing the block check,
X is the dummy variable in the polynomial representation of bits,
n is the number of bits in the information and block check fields,
k is the number of bits in the information field,
$G(X)$ is the polynomial representing the k information bits in the information field,
$K_1(X)$ and $K_2(X)$ are each polynomials of degree less than $n-k$ representing non-zero constants, and
$P(X)$ is the generator polynomial of degree $n-k$;
means at said transmitter for supplying in sequence a flag, the information field, the block check field and one or more flags to said communication medium;
said receiver including a decoder for generating a block check remainder of the quantity

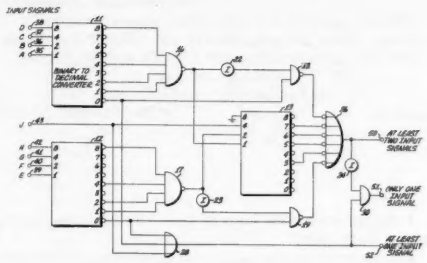
$$[X^{n-k}\cdot G(X)+R'(X)+X^{k}K_1(X)+E(X)]$$

multiplied by an arbitrary power of X where $E(X)$ is a polynomial representing a received error pattern; and
means coupled to receive said block check remainder for determining whether a detectable error occurred during transmission.

3,872,431
APPARATUS FOR DETECTING DATA BITS AND ERROR BITS IN PHASE ENCODED DATA

Edward R. Besenfelder, Phoenix, Ariz., and Stanley I. Friedman, Oklahoma City, Okla., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 10, 1973, Ser. No. 423,025
Int. Cl. G11b 27/36
U.S. Cl. 340—146.1 AX 4 Claims



1. Apparatus for signaling the number of errors in data characters comprising:

first, and second binary-to-decimal converters each having first, second, third and fourth input leads and first, second, third, fourth and fifth output leads;

a third binary-to-decimal converter having first, second, third and fourth input leads and first, second, third and fourth output leads;

a plurality of signal input terminals, a first of said input terminals being connected to said third input lead of said third converter, each of the remainder of said input terminals being connected to a corresponding one of said input leads of said first and said second converters;

first and second logic gates each having first, second, third and fourth input leads and an output lead, said second, third, fourth and fifth output leads of said first converter each being connected to a corresponding one of said input leads of said first gate, said second, third, fourth and fifth output leads of said second converter each being connected to a corresponding one of said input leads of said second gate;

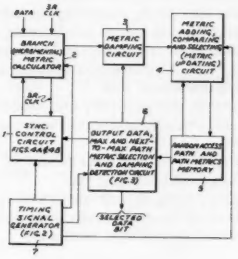
third and fourth logic gates each having first and second input leads and an output lead, said first input lead of said third gate being coupled to said output lead of said first gate, said second input lead of said third gate being connected to said first output lead of said first converter, said first input lead of said fourth logic gate being coupled to said output lead of said second gate, said second input lead of said fourth gate being connected to said first output lead of said second converter; and

a fifth logic gate having first, second, third, fourth, fifth and sixth input leads and an output lead, said output lead of said third gate being coupled to said first input lead of said fifth gate, said sixth input lead of said fifth gate being connected to said output lead of said fourth gate, said second, third, fourth and fifth output leads of said third converter each being coupled to a corresponding one of said second, third, fourth, and fifth input leads of said fifth logic gate, said output lead of said first gate being connected to said first input lead of said third converter, said output lead of said second gate being connected to said second input lead of said converter.

3,872,432
SYNCHRONIZATION CIRCUIT FOR A VITERBI DECODER

Otto Herbert Bismarck, Fords, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Apr. 10, 1974, Ser. No. 459,522
Int. Cl. G06f 11/12; G08c 25/00; H04l 1/10
U.S. Cl. 340—146.1 AQ 10 Claims


DATA
BIT CLK
BRANCH (HAMMING) METRIC CALCULATOR
METRIC ADDING CIRCUIT
METRIC ADDING, COMPARING AND SELECTING (METRIC UPDATING) CIRCUIT
SYNC. CONTROL CIRCUIT FIGS. 4A&B
OUTPUT DATA, MAX AND NEXT-TO-MAX PATH METRIC SELECTION AND DANGING DETECTION CIRCUIT (FIG. 3)
SURVIVOR PATH AND PATH METRICS MEMORY
TIMING SIGNAL GENERATOR (FIG. 2)
SELECTED DATA BIT

1. A synchronization circuit for a Viterbi decoder comprising:

a source of path metrics for a Viterbi code, each of said path metrics being updated sequentially in response to input Viterbi code data;

first means coupled to said source to determine a maximum path metric and a next-to-maximum path metric from said updated path metrics;

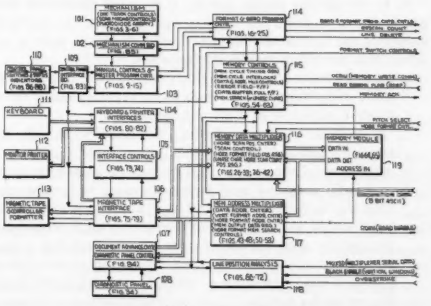
second means coupled to said first means to determine the spread between said maximum and said next-to-maximum path metrics; and

third means coupled to said second means responsive to said spread between said maximum and said next-to-maximum path metrics to select output code data from said source and to maintain said selected output code data in an in-phase condition and in an insync condition with respect to said input code data.

3,872,433
OPTICAL CHARACTER RECOGNITION SYSTEM

Thomas G. Holmes, Melbourne; Harrison B. Lidkea, Satellite Beach, and Kenneth L. Seib, Melbourne, all of Fla., assignors to Optical Business Machines, Inc., Melbourne, Fla.

Filed June 7, 1973, Ser. No. 367,881
Int. Cl. G06k 9/04
U.S. Cl. 340—146.3 AH 22 Claims



1. In an optical character recognition system of the type in which optical images of data characters to be read from data documents are converted to electronic signals for automatic processing and recognition, and wherein said system in capable of ignoring all characters on a data document other than

those located in prescribed data fields, a method characterized in that data field marks are not required on said data documents to designate said prescribed data fields, said method being further characterized by a format load mode wherein a format conditioning document, which is separate and apart from data documents to be read and which contains format marks which designate the locations of said prescribed data fields, is processed to identify said prescribed data fields in each of a series of data documents to be read during a read mode, said method including the steps of:

in said format load mode, detecting the locations of said format marks on said format conditioning document;

in said format load mode, storing the locations of data fields designated by the format marks detected on said format conditioning document; and

in said read mode, automatically and successively reading each data document in said series, said reading including the steps of:

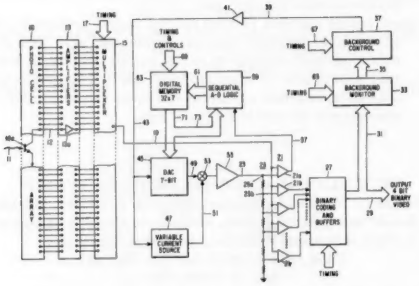
during the reading of each data document, retrieving the stored data field locations; and

processing only those data characters on each data document which are located in data fields which correspond to the retrieved data field locations.

3,872,434
DYNAMIC SAMPLE-BY-SAMPLE AUTOMATIC GAIN CONTROL

Dale R. Duvall, Fort Worth; Marion W. Neff, Arlington, and Paul D. Lawson, Irving, all of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Dec. 5, 1973, Ser. No. 421,814
Int. Cl. G06k *9/02*
U.S. Cl. 340—146.3 AG **5 Claims**



1. In an optical reader having a scanned photocell array producing a multiplexed analog signal stream by cyclically sampling the signals on channels leading from the cells in said array, the combination which comprises:

a. memory means to store digital coded words, one word for each said channel with each word representative of the relative response of a given channel,

b. a multibit analog-to-digital converter to which said stream is applied,

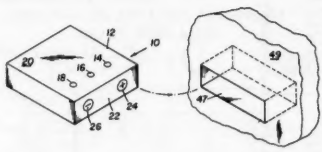
c. gain control means for said converter including means cyclically scanning said memory means in synchronism with the multiplexing of said signal channels to generate a stream of gain control voltage levels each level being dependent upon the word stored in memory for a given channel at the time the signal from said given channel passes to said converter to provide a multiplexed digital stream at the output of said converter which is independent of the differences in response of said channels to the same field of view, and

d. said converter having a voltage ladder to which said gain control voltages are applied and a plurality of differential amplifiers each connected at one input thereof to receive said signal stream and with connections between a second input thereof at spaced points along said ladder.

3,872,435
OPTO-ELECTRONIC SECURITY SYSTEM

Victor L. Cestaro, 19 Allegheny Dr. West, Farmingville, N.Y. 11738

Filed May 18, 1973, Ser. No. 361,807
Int. Cl. H04q *9/00*
U.S. Cl. 340—147 MD **18 Claims**



1. An opto-electronic security system for controling locking means, comprising

key means for producing distinct signal trains and transmitting said signal trains as light signals in accordance with a predetermined code combination, and

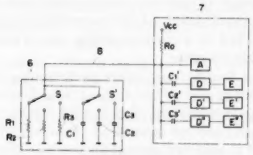
lock means for receiving the light signals,

said lock means comprising alarm means and decoding means electrically connected to said locking means and said alarm means for decoding the light signals in a predetermined manner whereby when the decoded signals compare with the predetermined code combination said locking means is actuated and opened and when the decoded signals do not compare with the predetermined code combination said locking means is maintained closed and the alarm means is activated.

3,872,436
ELECTRICAL SIGNAL TRANSMITTING SYSTEM

Takaomi Yoshida, Nagoya, Japan, assignor to Kabushiki Kaisha Tokai Rika Seisakusho, Aichi Pref., Japan

Filed May 21, 1973, Ser. No. 362,635
Claims priority, application Japan, May 23, 1972, 47-50399
Int. Cl. H04q *1/45, 1/18*
U.S. Cl. 340—147 PC **10 Claims**



1. A method for transmitting electrical signals between a transmitter and a receiver through a single signal line, comprising:

coupling a DC voltage discriminating means and plural condenser-grounded type oscillating circuits to the receiver end of said single signal line;

selectively closing and opening differently valued resistive dividing paths between the transmitter end of said signal line and ground to vary the amplitude of a DC voltage signal on said single signal line;

selectively opening and closing differently valued capacitive paths between the transmitter end of said single signal line and ground;

producing from a given said oscillating circuit, upon selective closure of a uniquely corresponding one of said capacitive paths in said transmitter, an AC signal on said single signal line; and

detecting in said transmitter, by said AC and DC signals on said single signal line, which of said paths of said transmitter have been selected.

3,872,437

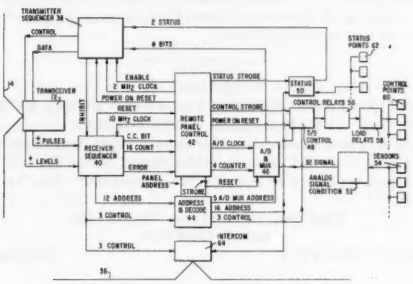
SUPERVISORY CONTROL SYSTEM

Charles Cross, Glenside, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 314,304, Dec. 12, 1972, abandoned, and Ser. No. 314,306, Dec. 12, 1972, , and Ser. No. 314,307, Dec. 12, 1972. This application Jan. 18, 1974, Ser. No. 434,708

Int. Cl. H04b *1/16;* **H04q** *1/00*

U.S. Cl. 340—147 SY **23 Claims**



17. A supervisory control system comprising

a central control station;

a plurality of remote stations; and

transmission line means connecting said central control station with said remote stations,

said central control station and said remote stations each including transmitter means for transmitting messages via said transmission line means in a biphase code with each bit having a bit time with a transition between first and second levels near the center thereof, and

said central control station and said remote stations each including receiver means for receiving messages from said transmitter means via said transmission line means, said receiver means including means for generating pulse signals in accordance with transitions of each bit of said transmitted messages and level signals in accordance with said first and second levels of each bit of said transmitted messages, data means, means for supplying said level signals to said data means, and timing means responsive to said pulse signals to supply data pulses to said data means to control passing of said level signals into said data means whereby the bits of said transmitted messages are self-clocked into said data means.

3,872,438

CREDIT CARD AND CREDIT CARD IDENTIFICATION SYSTEM FOR AUTOMATIC VENDING EQUIPMENT

William E. Cuttill, 907 Newport Dr., Fenton, Mich. 48430, and Vilma M. Wagner, 1081 W. Yale, Flint, Mich. 48503

Filed May 4, 1973, Ser. No. 357,509

Int. Cl. G06f *7/00;* **G11b** *23/00*

U.S. Cl. 340—149 A **6 Claims**

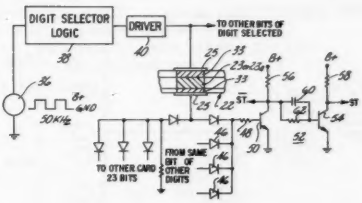
1. A vending machine system for dispensing products to a purchaser without the attendance continuous of sales personnel, comprising:

a credit identification card;

a first plurality of indicia of relatively high dielectric constant mounted in said card;

a second plurality of indicia of relatively low dielectric constant mounted in said card in a predetermined pattern with said first plurality;

means for sensing the electrical time constant characteristics of said indicia and providing a binary code output representative thereof;



means for manually selecting a digital code memorized and known by the purchaser to be identical to the code represented by the pattern on said card;

means for converting the digital code to a binary code;

means for comparing said two binary codes; and

enabling means responsive to coincidence between said two codes to enable the operation of said vending machine.

3,872,439

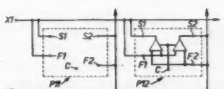
ELECTRONIC SWITCHING CIRCUIT FOR BIDIRECTIONAL TRANSFER

Hassan Paddy Abdel Salam, 80 Vicarage Ct., London, W-8, England

Filed Feb. 1, 1970, Ser. No. 438,767

Int. Cl. H04q *3/00*

U.S. Cl. 340—166 R **10 Claims**



1. Analog electronic switching means establishing selective bidirectional signal transfer between a first and a second signal terminal, said switching means including signal amplifier means controllable between a first condition in which said amplifier means provides coupling between said signal terminals to deliver at said second signal terminal a signal current having a magnitude proportional to the difference between the magnitudes of the signal potentials at said first and said second signal terminals and to deliver at said first signal terminal a signal current having a magnitude proportional to the difference between the magnitudes of the signal potentials at said second and said first signal terminals and a second condition in which signal coupling between said signal terminals is inhibited.

3,872,440
HOSPITAL COMMUNICATION SYSTEM

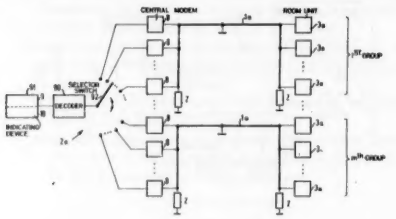
Leo Benz; Dieter Klein, both of Munich; Manfred Bauer, Neubiberg; Albert Figel, and Rolf Treutlin, both of Munich, all of Germany, assignors to Alois Zettler Elektrotechnische Fabrik GmbH, Munich, Germany

Continuation of Ser. No. 376,561, July 5, 1973, abandoned. This application July 10, 1974, Ser. No. 487,171

Claims priority, application Germany, July 10, 1972, 2223797

Int. Cl. H04q *5/00*

U.S. Cl. 340—171 R **26 Claims**



1. Communication system for hospitals and the like, said system transmitting communications signals between sub-units of room units and a central station over a common high-frequency line, each of said room units having a characteristic frequency assigned thereto which serves both as a room unit address signal and a carrier for the address signals of the sub-units, said system including:

a receiving device coupled to said high-frequency line for receiving communications signals from said room units; and

means said receiving device to the respective characteristic frequencies assigned to said room units in timed sequence.

3,872,441
SYSTEMS FOR TESTING ELECTRICAL DEVICES

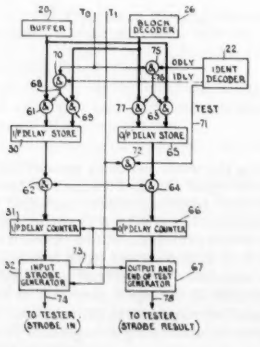
George William Cailow, Dukinfield, England, assignor to International Computers Limited, Putney, London, England

Filed Nov. 29, 1972, Ser. No. 310,426

Claims priority, application United Kingdom, Dec. 1, 1971, 55734/71

Int. Cl. G06f *1/04*

U.S. Cl. 340—172.5 **2 Claims**



1. In a dynamic circuit testing device having a plurality of test connections such as pins or the like connectable respectively to different portions of an electrical circuit to be tested, apparatus for controlling the time occurrence of signals associated with the test comprising:

a buffer means for registering applied characters in succession, said characters including identifier characters and data characters wherein at least some of the data characters represent increments of time associated with said test;

a decoder means responsive to an identifier character for generating at least first and second control signals;

a signal delay store;

first gating means responsive to said first control signal for permitting the passage of a data character representing an increment of time from said buffer means to said signal delay store;

generating means for generating a strobe signal at a predetermined time after the receipt of data character representing an increment of time, said predetermined time being related to the increment of time represented by the received data character; and

second gating means responsive to said second control signal for permitting passage of a data character representing an increment of time from said signal delay store to said generating means.

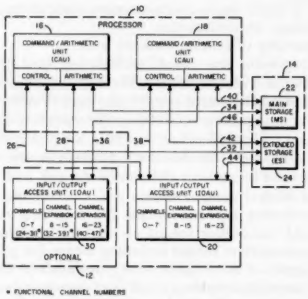
3,872,442
SYSTEM FOR CONVERSION BETWEEN CODED BYTE AND FLOATING POINT FORMAT

John A. Boles, Rosemount; Charles M. Chu, St. Paul; Peter B. Criswell, Bethel, and Aron Rolnitzky, Burnsville, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 14, 1972, Ser. No. 315,150

Int. Cl. G06f *9/00*

U.S. Cl. 340—172.5 **20 Claims**



1. Data format conversion apparatus for use in an electronic digital computer for converting coded byte string data word formats and floating-point data formats, said computer being of the type including receiving means having storage means for receiving and at least temporarily storing a digital data word representing a numerical quantity expressed as a floating-point number in a first data format of a first numerical capacity during its conversion to an equivalent numerical value expressed as a floating-point number in a second data format, said first data format including a first manifestation indicative of the characteristic representing the power of the number base of said data word in said first format, second manifestations indicative of the mantissa for representing the numerical value of the data word expressed in said first data format, and third manifestations indicative of the arithmetic sign in said first data format; arithmetic means having input means coupled to said storage means; output means; and instruction control means responsive to one of a set of conversion instruction words for developing control signals for said

arithmetic means during the entire conversion period, the improvement comprising:

branch control means in said arithmetic means including means for effecting AND and OR logic functions connected to receive as inputs thereto said control signals and selected signals from said receiving means;

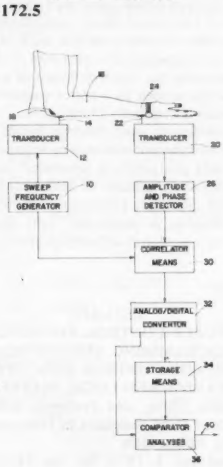
branch designator flip-flop means coupled to said branch control means adapted to be set and cleared in a predetermined sequence governed by said branch control means for converting said first manifestation to a fourth manifestation indicative of the characteristic representing the power of the number base of said data word in said second format, for converting said second manifestations indicative of the mantissa for representing the numerical value of said data word expressed in said first data format to fifth manifestations indicative of the mantissa for representing the numerical value of said data word expressed in said second data format, and for converting said third manifestation indicative of the arithmetic sign in said first data format to sixth manifestations indicative of the arithmetic sign in said second data format; and

means for providing said fourth, fifth and sixth manifestations to said output means.

3,872,443
INDIVIDUAL IDENTIFICATION APPARATUS AND METHOD USING FREQUENCY RESPONSE

James H. Ott, Akron, Ohio, assignor to Novar Electronics Corporation, Barberton, Ohio

Filed Jan. 26, 1973, Ser. No. 326,832
Int. Cl. G06f *1/00*
U.S. Cl. 340—172.5 **10 Claims**



1. A method for comparing a subsequently interrogated person to a previously interrogated person as an aid in identifying individual persons, the method comprising:

a. applying sinusoidal physical vibration sonic wave energy to the human body of a first person;

b. detecting frequency response characteristics of at least a portion of said human body of said first person by detecting the frequency response of at least said portion to said applied wave energy;

c. storing data representing said characteristics;

d. subsequently applying sinusoidal physical vibration sonic wave energy to the human body of a subsequent person;

e. detecting frequency response characteristics of the body of said subsequent person by detecting the frequency response of at least said portion to said applied wave energy; and

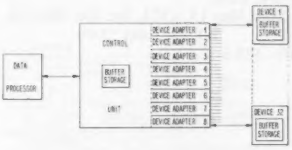
f. comparing said characteristics of said first person with said characteristics of said subsequent person to determine whether said characteristics are within preselected tolerances of each other

wherein the frequency response characteristics which are detected comprise a transfer function between corresponding body parts of each said body.

3,872,444
TERMINAL CONTROL UNIT

James Leonard Cleveland, Kingston; Richard Alfred Jones, Redhook; Theodore Edwin Larson, Saugerties; Kenneth Rogers McNary, Hyde Park, and James Theodore Zahorsky, Saugerties, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 23, 1973, Ser. No. 335,269
Int. Cl. G06f *3/04, 3/12, 3/14*
U.S. Cl. 340—172.5 **16 Claims**



1. In a data processing system comprising a data processor and a terminal control unit having a plurality of attached terminal devices with said data processor transmitting a control message to said terminal control unit directing that a data word message be transferred between designated terminal devices including a word selection designation designating which words of the data word message are to be selected for transfer and said terminal control unit being responsive to said control message for controlling the selective transfer of said data word message between the designated terminal devices without further accessing said data processor, said terminal control unit comprising:

means for receiving the control message from said data processor,

means responsive to said control message receiving means for producing a first address signal for addressing a first one of said plurality of terminal devices,

first signalling means for signalling said first terminal device to transfer a data word message to said terminal control unit,

said data word message being formatted into fields of data words with the beginning of a field being identified by a field control word followed by associated data words up to but not including the next field control word, the field control word defining the field characteristics for all the data words contained in the field including identification of the field as being protected from operator modification or unprotected and available for operator modification,

storage means for storing the data word message received from said first terminal device,

means responsive to said control message receiving means for producing a transfer control signal indicating which words of the data word message are to be selected for transfer from the storage means of said terminal control unit,

means for cyclically examining the data word message stored in said storage means a word at a time,

said examining means being effective to produce a first signal when the word under examination is a field control word, a second signal when the word under examination is a data word and being further effective when the word under examination is a field control word to produce a third signal when the field of data words following the field control word is a protected field and a fourth signal

when the field of data words following the field control word is an unprotected field,

modifier means responsive to the signals produced by said examining means and said transfer control signal for selectively modifying the data words of each field,

means responsive to said control message receiving means for producing a second address signal for addressing a second one of said plurality of terminal devices,

second signalling means for signalling said second terminal device that a data word message is to be transferred from said terminal control unit, and

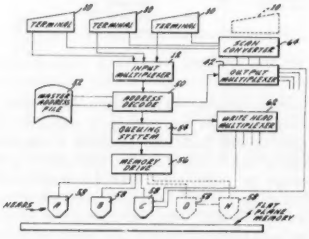
means for transferring the data word message from the storage means of said terminal control unit to said second terminal device.

3,872,445

AUTOMATED DATA LIBRARY SYSTEM INCLUDING A FLAT PLANE MEMORY

Edmund M. Pease, Glendale, Calif., assignor to Xynetics, Inc., Canoga Park, Calif.

Filed May 11, 1973, Ser. No. 359,534
Int. Cl. G06f *13/00*
U.S. Cl. 340—172.5 **38 Claims**



1. An automated data library system including the storage of information in at least one central location and for retrieving the stored information in accordance with requests for particular stored information from a plurality of terminals, including

first means including a plurality of terminals, a transmission medium connected to a central location of stored information, means connected to the terminals and the said medium for transmitting requests for particular stored information at the central location and receiving information from the central location in accordance with the requests,

second means located at said central location for storing information at a plurality of fixed location in a stationary plane and with the area of the plane memory of a particular size to provide the particular information at particular locations within the area of the plane and with the plane memory maintained stationary from before requests for particular stored information until after the retrieval of stored information in response to those particular requests,

third means including at least one sensor for retrieving the information stored at the pluralities of fixed locations in the stationary plane memory,

fourth means providing a number of X-Y positioners complementing the number of sensors included in the third means and with the X-Y positioners coupled to the sensors to provide movement of the sensors along a plane parallel to the plane of the plane memory to the plurality of fixed locations in the stationary plane memory, and

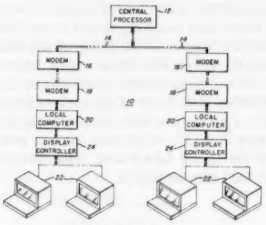
fifth means coupled to the first means and the fourth means to control the fourth means to provide X-Y movement of at least the one sensor in accordance with requests for particular stored information at particular locations to retrieve the particular stored information at the particular locations for transmission back to the terminals.

3,872,446

VISUAL DISPLAY SYSTEM

Derek Chambers, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 143,343, May 14, 1971,. This application May 7, 1973, Ser. No. 358,212
Int. Cl. G06f *3/14*
U.S. Cl. 340—172.5 **10 Claims**



1. Apparatus for generating a visual display of characters on a cathode ray tube in a raster;

said generated characters being formed from a dot matrix comprising means for generating a plurality of rows of characters each of which generated characters comprises a plurality of horizontal slices each of which slices comprises a plurality of dots such that each of said generated characters is comprised of a plurality of dots;

means for sweeping the electron beam of said cathode ray tube across the screen in a raster pattern such that said electron beam is normally blanked;

means for unblanking said electron beam in accordance with a predetermined instruction sequence such that a display of said characters is generated; and

means for displacing certain of said generated dots from their normal character positions such that an enhanced character display is produced, said displacing means operating independently of said electron beam sweeping means.

3,872,447

COMPUTER CONTROL SYSTEM USING MICROPROGRAMMING AND STATIC/DYNAMIC EXTENSION OF CONTROL FUNCTIONS THRU HARDWIRED LOGIC MATRIX

Giancarlo Tessera, Milan, and Ferruccio Zulian, Cornaredo (Milan), both of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed Apr. 2, 1973, Ser. No. 347,316
Claims priority, application Italy, Apr. 7, 1972, 22889/72
Int. Cl. G06f *9/16*
U.S. Cl. 340—172.5 **8 Claims**

1. A microprogrammed digital electronic data processing system comprising:

a microprogram control unit comprising a microprogram store for storing a sequence of microinstructions with individual microinstructions at respective address locations in said store;

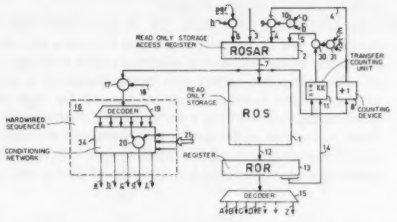
a loadable address register for storing an address code and addressing said microprogram store;

read out means responsive to a said stored address code for reading out a said microinstruction from said store;

an output register for storing a said microinstruction read out from said microprogram store;

a first decoder for decoding the content of said output register as a set of microcommands; and

hardwired sequencer means having a set of inputs and a set of outputs, said hardwired sequencer means including gate means responsive to one of said microcommands for coupling said address code from said loadable address

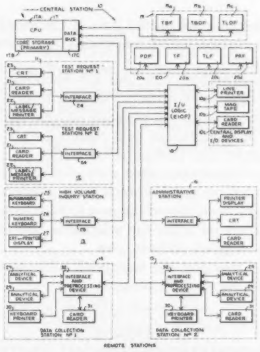


register to said set of inputs of said hardwired sequencer means, said hardwired sequencer means further including conversion means for converting said address code to a set of additional microcommands on said set of outputs of said hardwired sequencer means.

3,872,448
HOSPITAL DATA PROCESSING SYSTEM

Baker A. Mitchell, Jr., Houston, Tex., assignor to Community Health Computing, Inc., Houston, Tex.

Filed Dec. 11, 1972, Ser. No. 313,684
Int. Cl. G06f *15/06, 15/42*
U.S. Cl. 340—172.5 **2 Claims**

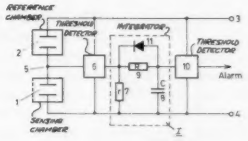


1. An automatic data processing system for handling medical and patient records on an in-line basis during daily functioning of a hospital comprising: a central station including data processing apparatus for storage and processing of medical and patient records, said data processing apparatus providing for storage of separate files which may be individually accessed for record storage or retrieval, said separate files including a Patient Description File for storing descriptive data on patients of said hospital, a Test Library File for storing data concerning pathological tests available at said hospital, a Transaction File for relatively short term storing of patient and test data being acted on, and a Past Results File for storing past patient test data; at least one test request station including a test request device for permitting an operator to enter a test request into said Transaction File for a particular test on a particular patient specimen, and a readout device for providing readout of data in said Transaction File, interface means connecting the test request device and the readout device to said Transaction File, at least one data collection station including at least one analytical device for performing a test, and interface means for permitting data collected at said data collection station to be transferred to said Transaction File and means for automatically transferring completed transaction data in said Transaction File into said Past Result File at preselected intervals of time.

3,872,449
FIRE DETECTOR AND METHOD EMPLOYING ASSYMETRICAL INTEGRATOR

Andreas Scheidweiler, Stafa, Switzerland, assignor to Cerberus AG., Mannedorf, Switzerland

Filed Mar. 8, 1974, Ser. No. 449,287
Claims priority, application Switzerland, Mar. 30, 1973, 4621/73
Int. Cl. G08b *17/12*
U.S. Cl. 340—228.1 **11 Claims**



1. Method to indicate occurrence of a fire having means generating a signal indicative of fire comprising

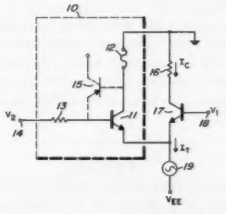
detecting a first threshold level of said fire indication signal, and providing a first signal representative of the fire indication signals having exceeded said first threshold level;

integrating rise in the level of said first signal with a first integration time constant, and drop in level of the first signal with a second integration time constant which is small with respect to said first integration time constant; and detecting when the integrated signal reaches a second threshold value, and thereupon providing an alarm signal.

3,872,450
FUSIBLE LINK MEMORY CELL FOR A PROGRAMMABLE READ ONLY MEMORY

Thomas Linn Reynolds, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 21, 1973, Ser. No. 372,454
Int. Cl. G11c *17/00*
U.S. Cl. 340—173 SP **6 Claims**



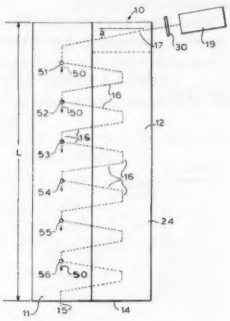
1. An integrated circuit personalizable or programmable read only memory comprising:

a. a plurality of interconnected storage cells and means for accessing the plurality of storage cells;

b. the plurality of storage cells each including a first bipolar transistor having a fusible element connected to its collector terminal; and

c. the accessing means connected to the plurality of cells being responsive for opening predetermined fusible elements.

3,872,451
LIGHT OPTIC DATA HANDLING SYSTEM
Joseph T. McNaney, 8548 Boulder Dr., La Mesa, Calif.
Filed Apr. 1, 1974, Ser. No. 456,548
Int. Cl. G11c *11/42, 13/04*
U.S. Cl. 340—173 LM **9 Claims**



1. An optical system for use in a data handling system, comprising:

a. a source of light and means for directing light therefrom along a primary optical path while undergoing a series of total internal reflections within said system and to establish an availability of said light at a plurality of predetermined light output positions in said system for an electrically controlled redirecting of said light along a selected one of a plurality of secondary optical paths stemming from said positions;

b. said means including an array of light reflecting interfaces of first and second light conducting media, each said interface presenting a length dimension;

c. said interfaces each angularly oriented so as to establish an optical relationship one with respect to the other and the path of light from said source for providing a series of 360° primary optical paths for said light, each 360° path displaced one with respect to the other in a side-by-side relationship in the direction of said length dimension;

d. a plurality of electro optic light reflection control means each provided with electrode means for extending the influence of an electrical potential thereto;

e. said control means supported in an optical light reflection control relationship with said 360° primary optical paths at each of said light output positions in the system; and

f. means for selectively frustrating internal light reflections and thereby effect a redirecting of said light away from a selected one of said light output positions to one of said plurality of secondary optical paths upon the extending of said influence to a corresponding one of said control means.

3,872,452
FLOATING ADDRESSING SYSTEM AND METHOD
Edward H. Stoops, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 17, 1974, Ser. No. 461,576
Int. Cl. G11c *13/00*
U.S. Cl. 340—173 R **13 Claims**

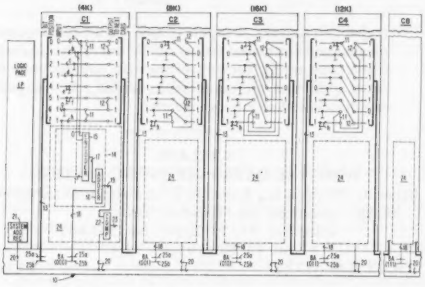
1. Floating addressing system, comprising

a plurality of addressable units having different numbers of addresses constituting integral multiples of a predetermined basic number,

each of said units having a similar preselected number of pins representing floating address inputs and an identical number of pins representing floating address outputs, each set of input and output pins being arranged in low to high order sequence,

means for applying a preselected coded signal to the input pins of a first one of said units,

means connecting each input pin in each unit with that particular one of the output pins on the same unit that is indicative of the number of addresses such unit has, each of said particular output pins being displaced a similar predetermined number of places toward the high order position indicative of the number of said multiples of said basic number of addresses in said same unit to cause the coded input signal to be shifted toward the high order position said predetermined number of places and pro-



vide end around carries to generate any low order positions,

means connecting the output pins of each unit always with the same corresponding associated input pins in the succeeding unit,

encoding means for each unit for encoding the floating address input to that particular unit to provide for such unit an encoded output assigned address indicative of the number of multiples of said basic number of addresses that precedes that particular unit,

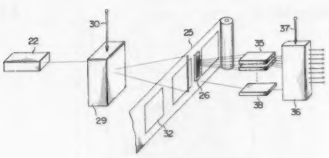
comparator means associated with each unit for comparing the encoded assigned address with a selectable address corresponding to that of the unit to be selected to provide an output signal when the selectable address equals the encoded assigned address, and

means for conveying the selectable address in parallel to each such comparator means.

3,872,453
INFORMATION RETRIEVAL SYSTEM
Katsuji Tsukamoto; Nobuichi Ikeno, and Keiji Okada, all of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan
Filed Sept. 18, 1973, Ser. No. 398,429
Claims priority, application Japan, Sept. 18, 1972, 47-93963
Int. Cl. G11c *13/04*
U.S. Cl. 340—173 LM **10 Claims**

1. An information retrieval system which comprises a recording medium for optically storing pieces of information, the pieces of information including a plurality of characters; optical means for scanning the recording medium, which has information stored therein, by a beam of light modulated according to the respective characters of a prescribed series of characters for retrieval and generating signals denoting bright or dark shades of light according to whether or not coincidence is established between the respective characters of said prescribed series and some of the characters designating all the pieces of information stored in the recording medium; photoelectric conversion means having a plurality of

members to generate an electric signal denoting coincidence or noncoincidence upon receipt of a signal indicating a bright or dark shade of light; and a logic processing circuit for logically processing a signal delivered from said photoelectric conversion means and generating a retrieval signal showing whether or not the prescribed series of characters for retrieval are included in the characters designating the respective pieces of information stored in the recording medium, the logic processing circuit including AND gates whose first input



terminals are successively supplied with output signals from the members of the photoelectric conversion means and shift registers which successively receive and store output signals from the AND gates in a number corresponding to each character of the prescribed series; the output terminals of the shift registers being connected to the second input terminals of the successively following AND gates whereby when the last character of the prescribed series is retrieved, signals resulting from the retrieval of all the characters thereof are generated through the output terminals of the AND gates.

3,872,454

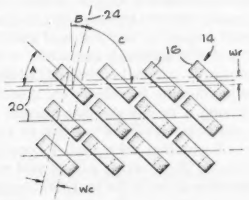
SKEWED CORE MATRIX

Michael F. Boice, Torrance, and Niels Krag, Pacific Palisades, both of Calif., assignors to Electronics Memories & Magnetics Corporation, Hawthorne, Calif.

Filed Dec. 13, 1973, Ser. No. 424,296

Int. Cl. G11c *5/02, 11/06*

U.S. Cl. 340—174 M **4 Claims**



1. A magnetic core memory comprising:

a support;

a plurality of magnetic cores arranged in substantially straight rows and columns on the support, with the axes of the columns oriented at an angle less than 90° and more than 45° to the axes of the rows, each core having a hole and each core oriented with the axis of its hole angled at least several degrees from both the column axis and from the row axis on which the core lies; and

a plurality of wires extending through the cores along the axes of the rows and along the axes of the columns.

3,872,455

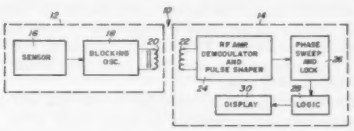
PHYSIOLOGICAL MEASUREMENT DISPLAY SYSTEM

Charles H. Fuller, Carson, and Carl E. Herring, Huntington Beach, both of Calif., assignors to Monitron Industries, Inc., Huntington Beach, Calif.

Continuation-in-part of Ser. Nos. 199,675, Nov. 17, 1971, and Ser. No. 200,368, Nov. 18, 1971, and Ser. No. 199,847, Nov. 18, 1971, and Ser. No. 199,979, Nov. 18, 1971. This application Nov. 13, 1972, Ser. No. 306,253

Int. Cl. G08c *19/26*

U.S. Cl. 340—189 M **42 Claims**



1. A system for transmitting and receiving signals corresponding to a physiological parameter of a subject, comprising:

a sensing element adapted to detect a desired physiological parameter of the subject;

a transmitter adapted to transmit radio frequency signals modulated in accordance with signals that correspond to the detected physiological parameter, and

a receiver unit adapted to inductively receive said transmitted signals, said receiver unit including demodulator means for producing a train of pulses at a frequency corresponding to the frequency of modulation of said radio frequency siganls;

phase lock circuit means adapted to generate a range of frequencies that overlaps said frequency of modulation, said phase lock circuit means being connected to receive and compare the pulses developed at the output of said demodulator with said range of frequencies, whereby said phase lock circuit means locks onto, and thereafter generates output pulses at a rate corresponding to, said frequency of modulation; and

means responsive to said output pulses for measuring the burst rate of the received radio frequency signals to indicate the magnitude of said physiological parameter.

3,872,456

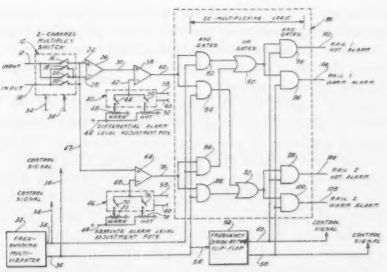
TWO-LEVEL MULTIPLEX ALARM MONITOR FOR HOT BOX DETECTOR SYSTEM

Arthur J. Glazar, Kings Park, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,668

Int. Cl. G08b *21/00*; **B61k** *9/06*

U.S. Cl. 340—231 **7 Claims**



1. A two-level alarm monitor for use with a hot box detector system having a first sensor and a second sensor each associ-

ated with a rail of a track and each adapted to generate an output electrical signal responsive to the heat generated by a bearing passing on its associated rail, said alarm monitor comprising:

a. means connected to the outputs of said sensors for alternately obtaining the difference between (1) said first sensor signal and said second sensor signal and (2) said second sensor signal and said first sensor signal;

b. first comparator means interconnected to said aforementioned means for comparing the difference between said sensor signals alternately to (1) a first predetermined signal level and (2) a second predetermined signal level;

c. second comparator means connected to the outputs of said sensors for alternately comparing (1) the output of said first sensor and (2) the output of said second sensor to (3) a third predetermined level and (4) a fourth predetermined level; and,

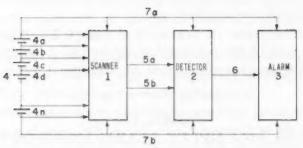
d. demultiplexing means connected to said first and second comparators for generating an alarm signal in the event (1) the difference between said sensor signals exceeds one or both of said first or second predetermined levels and/or (2) one or both of said sensor output signals exceeds one or both of said third or fourth predetermined levels.

3,872,457

BATTERY MONITOR

John S. Ray, 138 Belfast Dr., San Antonio, Tex. 48209, and James D. King, San Antonio, Tex., assignors to said Ray, by said King

Filed July 31, 1972, Ser. No. 276,389
Int. Cl. G08b *21/00*
U.S. Cl. 340—249 **3 Claims**



1. A battery monitor system for multi-cell batteries comprising:

continuous scanner means for sequentially and repeatedly establishing contact across individual cells of the battery;

detector means coupled to said scanner means for evaluating the electrical condition of the cell being connected to said scanner means;

means for comparing the electrical condition of the cell with a preselected range of voltages, said comparing means emitting an electrical signal when said electrical condition is outside said predetermined range; and

alarm means controlled by said electrical signal for producing an alarm signal upon receiving said electrical signal from said comparing means; said scanner means includes a pulse generator generating uniformly timed pulses;

a counter means for counting said uniformly timed pulses, said counter means having outputs equal in number to the number of cells to be monitored; and

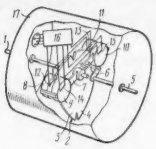
a group of relays actuated by one of said output counter means, said relays being operable to provide individual electrical connections to one of said battery cells.

3,872,458

CRANE BOOM-OUT TRANSMITTER

Savely Solomonovich Schedrovitsky, 13 Parkovaya ulitsa, 25, korpus 1, kv. 12; Leonid Fomich Goncharevich, Dmitrovskoe shosse, 145, korpus 3, kv. 36; Karl Vladimirovich Pruss, ulitsa Usacheva 29, kv. 132; Alexei Pavlovich Lebedev, Kursovoi pereulok, 1, kv. 58, all of Moscow, and Valentin Nikolaevich Gontar, ulitsa Revoljutsii 31, kv. 5, Topki Kemerovskoi oblasti, all of U.S.S.R.

Filed Jan. 2, 1973, Ser. No. 320,682
Claims priority, application U.S.S.R., Dec. 31, 1971, 1,732,412
Int. Cl. G08b *21/00*
U.S. Cl. 340—267 C **4 Claims**



1. A crane boom radius transmitter comprising: a first input shaft coupled to a crane boom and rotating the boom angle changes; a second input shaft coaxial with said first shaft and mechanically coupled with said crane boom and rotating as the boom length changes; a boom radius-to-electric signal converter having a movable member and means for converting the angle of rotation of said movable member into an electric signal, said converter being mechanically linked with said first and second input shafts; said movable member being mechanically coupled with said first input shaft and being made in the form of a screen comprising two sections; said means for converting the angle of rotation of said movable member into an electric signal coupled to said screen and including an inductively coupled detector and a sine-wave generator; two pairs of windings positioned in magnetically coupled cores and effecting the inductive coupling between said detector and said sine-wave generator; said pair of windings each having a primary winding incorporated in the circuit of said sine-wave generator and a secondary winding incorporated in the circuit of said detector; said cores being mechanically linked with said second shaft and moving relative to said screen when said second shaft is rotated; a first section of said screen having a profile defined by a variable radius curve and being arranged with regard to said cores of said first pair of windings so that said first section is constantly in the working gap of said magnetically coupled cores and, while moving, it alters the magnetic coupling therebetween; a second section of said screen having a profile defined by said curve of a variable radius and being arranged relative to said cores of said second pair of windings such that it constantly, while moving, is arranged in the working gap of said magnetically coupled cores, thereby altering the magnetic coupling therebetween in an inverse manner to the alteration of the magnetic coupling between said first pair of windings, thus altering said electric signal.

3,872,459

BURGLAR AND WARNING ALARM AND SYSTEM

Ralph H. Curtis, 1106 S. Beacon, Muncie, Ind. 47302

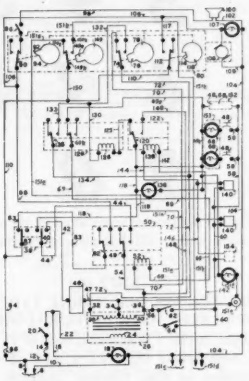
Continuation-in-part of Ser. No. 237,965, March 24, 1972,. This application June 4, 1973, Ser. No. 366,647
Int. Cl. G08b *13/08*
U.S. Cl. 340—276 **12 Claims**

1. A warning and alarm system, comprising:

a plurality of sensing devices to monitor a certain happening;

each sensing device having operatively associated therewith electrical circuitry whose energization is related to the actuation of the respective sensing device;

and a panel or grouping of monitoring indicator means, each respectively operatively associated with a certain one of said sensing devices, and with the certain respective said electrical circuitry associated with a respective sensing device, designating to the user the particular sensing device which is in the area or place of a happening being monitored by said system;



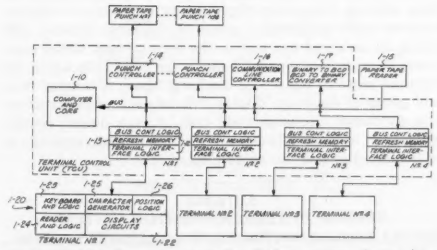
in a combination in which relays exclusively of normally-closed type are provided in the said circuitry to transfer power, during a said happening, to the said monitoring indicator means and thereby energizing the same to provide the specified operativity thereof;

and in which the sensing devices are of at least two different sets, and in which a happening-actuation of a sensing device of one of the sets will actuate the respective monitoring indicator means thereof irrespective of whether a sensing device of another of the sets has been actuated.

3,872,460
VIDEO LAYOUT SYSTEM

Walter G. Fredrickson, Indialantic; Albert W. Heitmann, Melbourne, and Howard A. Thraikill, Indialantic, all of Fla., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Apr. 13, 1973, Ser. No. 350,707
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 AD **11 Claims**



1. In a video layout system for fitting prepared text in a desired layout for driving typesetting equipment, the combination comprising

a terminal including

means for reading stored text and layout instructions,

a keyboard for selecting alphanumeric characters in the text to be displayed and for selecting layout instructions for the displayed text,

video display means for displaying the text and layout instructions,

character generating means responsive to read and keyboarded characters for driving said video display means,

position logic means responsive to layout instructions that were read and to keyboarded layout instructions for controlling the positioning of the displayed text elements by said video display means, and

means for encoding the read and keyboarded characters and layout instructions in digital data formats;

a terminal control unit including

means for temporarily storing encoded data from said terminal,

computer means responsive to the data stored in said storing means for processing said data in accordance with said layout instructions,

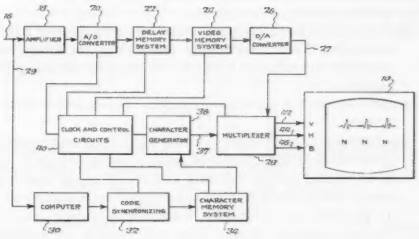
means for transferring the processed data to said terminal for driving said character generating means and position logic means therewith to effect corresponding changes in the layout of the displayed text; and

means for at will storing a coded format representative of the changed layout in the displayed text for driving the typesetting equipment.

3,872,461
WAVEFORM AND SYMBOL DISPLAY SYSTEM

Norman A. Jarosik, Tonawanda, and Benjamin H. Weppner, Snyder, both of N.Y., assignors to Mennen-Greatbatch Electronics, Inc., Clarence, N.Y.

Filed Oct. 26, 1972, Ser. No. 300,904
Int. Cl. G08b *5/36*
U.S. Cl. 340—324 AD **31 Claims**



1. In combination:

a. display means of the type having a display trace sweep for providing a visual image in response to signals applied thereto;

b. input means adapted to be coupled to a signal representing information;

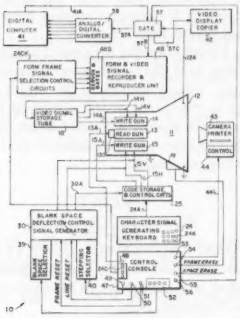
c. means connected to said input means for examining said information signal and for providing a signal representation of a symbol selected according to the nature of said information signal; and

d. signal applying means connected to said input means and to said means providing said signal representation of a symbol for applying said information signal and said signal representation to said display means for providing visual images of said information signal and said symbol simultaneously on said display means in corresponding relation to each other.

3,872,462
FORM FILLING SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 225,173, Aug. 27, 1962, and a continuation-in-part of Ser. No. 325,934, Jan. 22, 1972,.
This application Feb. 16, 1973, Ser. No. 333,119
Int. Cl. H01j *29/70*
U.S. Cl. 340/324 A 16 Claims



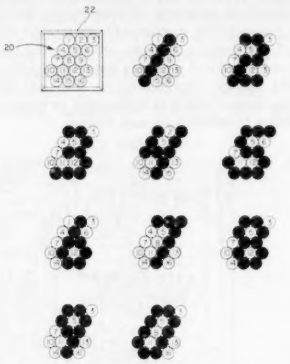
1. A system for generating forms comprising:
a viewing screen,
first means for generating an image on said screen of a form containing fixed information and having locations indicated therein where it is desired to provide variable information,
second means for generating images of characters on said screen,
third means for electrically controlling said second means to generate selected character images along selected portions of said screen defining said locations of said form where it is desired to provide variable information so as to generate a composite monitorable image on said screen composed of said fixed and variable information, and
fourth means for scanning the information defined by said composite image and generating information defining said fixed and variable information in another form.

3,872,463
ALPHANUMERIC DISPLAY SYSTEM

James M. Lapeyre, 13 Richmond Pl., New Orleans, La. 70115

Continuation of Ser. No. 244,425, April 17, 1972, abandoned.
This application Dec. 17, 1973, Ser. No. 425,499
Int. Cl. G09f *9/32*
U.S. Cl. 340—336 14 Claims

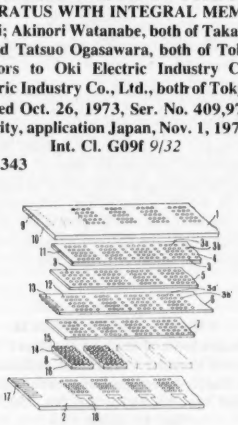
1. An alphanumeric display system comprising in combination:
an array of at least 16 electrically energizable, light-emitting elements; and
means for energizing selected combinations of said elements to form numerals, letters and other symbols;
said array consisting of four horizontal rows each including at least three of said elements and one row including at least four of said elements, all arranged in nested relation so as to form plural element columns inclined with respect to said horizontal rows at an angle of about 60° both to the right and to the left as seen by the viewer.



3,872,464
COLD CATHODE DISCHARGE TYPE DISPLAY APPARATUS WITH INTEGRAL MEMORY

Rentaro Sasaki; Akinori Watanabe, both of Takasaki; Mamoru Ikegame, and Tatsuo Ogasawara, both of Tokyo, all of Japan, assignors to Oki Electric Industry Co., Ltd., and Okaya Electric Industry Co., Ltd., both of Tokyo, Japan

Filed Oct. 26, 1973, Ser. No. 409,973
Claims priority, application Japan, Nov. 1, 1972, 47-125410
Int. Cl. G09f *9/32*
U.S. Cl. 340—343 3 Claims



1. In a cold cathode discharge type display apparatus of the class wherein letters are displayed by a plurality of display sections each including a group of discharge display cells which are arranged in a matrix, the improvement which comprises an additional group of discharge code cells which are disposed close to but whose discharge space is isolated from said group of discharge display cells of each display section, said additional discharge code cells of each display section being used to store a binary code of a letter subsequently to be displayed in said discharge display cells.

3,872,465
SEISMIC PLAYBACK/MONITOR SYSTEM

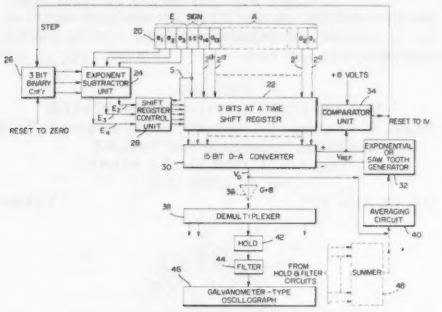
Robert J. Loofbourrow, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 113,844, Feb. 9, 1971, abandoned.
This application Apr. 27, 1973, Ser. No. 354,969
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 DA 14 Claims

1. A method for providing analog signals V_o, suitable for making a visible display, in accordance with the following equation:

$$e_{in} = \pm AG^{-E}$$

wherein e_{in} represents the amplitude of a particular analog signal among a wide dynamic range of analog signals, A represents a matissa, G represents a radix of the number system used, and E represents an exponent and wherein G is a constant, which comprises; providing digital signals forming a digital word for each analog signal in said range of analog signals, some of said signals in a digital word represent A and some represent E; generating a periodic analog reference signal V_{ref} which has maximum and minimum signal levels; generating a digital signal corresponding to a number K,



changing said K digital signal so as to change the value of the number K each time V_{ref} reaches its maximum level; combining the digital signals corresponding to K and E to produce another digital signal corresponding to (K - E); shifting the position of the digital signals corresponding to the term A in accordance with the K - E digital signal to produce another digital signal representing a modified A; combining the analog signal V_{ref} and the signal representing a modified A to produce an analog signal V_o for each digital word; averaging each of the analog signals V_o developed from each digital word; and producing said analog signal V_{ref} as a function of the analog signals V_o so averaged.

3,872,466

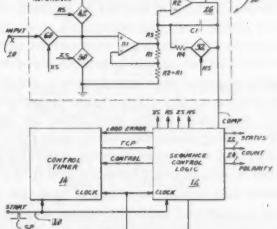
INTEGRATING ANALOG-TO-DIGITAL CONVERTER HAVING DIGITALLY-DERIVED OFFSET ERROR COMPENSATION AND BIPOLAR OPERATION WITHOUT ZERO DISCONTINUITY

Ivar Wold, Medfield, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed July 19, 1973, Ser. No. 380,690

Int. Cl. H03k *13/20*

U.S. Cl. 340—347 NT **33 Claims**



1. An analog-to-digital converter comprising:

an integrator arranged to produce ramp signals at rates corresponding to the magnitude of signals applied to the input thereof, the ramp direction being determined by the polarity of the applied signal;

means to condition said integrator to start integrating from a predetermined output datum level at a start time;

means to supply reference signals of opposite effective polarity for application to the input of said integrator;

clock means for producing clock pulses and successive timing control pulses following said start time;

switch means for applying signals to the input of said integrator;

first means to operate said switch means at said start time to apply to said integrator one of said reference signals in a given polarity to cause said integrator to ramp away from said datum level for a first time period as measured by said clock means;

second means to operate said switch means subsequent to said first time period to apply to the input of the integrator one of said reference signals of polarity opposite to said given polarity to cause said integrator to ramp back towards said datum level during a second time period;

a comparator coupled to the output of said integrator for producing a compare signal when said integrator output returns to said datum level, thereby signalling the end of said second time period;

third means responsive to the development of said compare signal at the end of said second time period for activating said switch means to apply to said integrator input for a third time period a composite signal including one of said reference signals and the unkown analog signal which is to be converted to a digital signal, said third time period being terminated upon the occurrence of a first one of said timing control pulses;

means operable at the termination of said third time period for applying to the input of said integrator one of said reference signals of polarity opposite to that of said composite signal, thereby to ramp said integrator output back towards said datum level during a fourth time period; and digitizing means coupled to the output of said comparator and to said clock means for producing an output digital signal representing the number of clock pulses occurring between the appearance of a second one of said timing control pulses and the development by said comparator of a compare signal signalling the end of said fourth time period.

3,872,467

AUTOMATIC DIALER

Leander Bruce Daniels, and James W. Azbell, both of Columbus, Ohio, assignors to MI² , Columbus, Ohio

Filed Mar. 21, 1973, Ser. No. 343,428

Int. Cl. G08c *1/00*

U.S. Cl. 340—364 **9 Claims**

1. An automatic dialer having a manually selectable dial address code and comprising:

a. A plurality of single pole switches each having a selector with at least ten manually selectable positions, the corresponding positions of each switch being interconnected to form a unified output, each switch settable at positions corresponding to the numbers in the dial address code;

b. a switch interrogation means for sequentially applying a first selected logic level to each one of said selectors;

c. a position interrogation means having a plurality of outputs for sequentially applying a second selected logic level at each of its outputs;

d. a pair of dialing contacts, and pulser clock means for simultaneously periodically operating said pair of dialing contacts and triggering the advance of said position interrogation means;

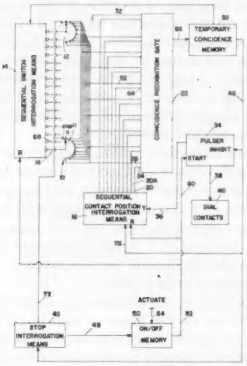
e. a coincidence recognition gate having a plurality of pairs of inputs, one input of each pair connected to a different one of at least nine of said unified switch output and the other inputs of each pair connected to a different one of the output of said position interrogation means said rec-

ognition gate providing a third output logic level for triggering the advance of said switch interrogation means, for resetting said position interrogation means and for temporarily inhibiting said pulser means all in response to the coincidence of said first logic level from said switch interrogation means and a second logic level from said position interrogation means; and

f. logic circuit means for initiating operation of said pulser prior to interrogation of the switch positions and for resetting said switch interrogation means after dialing is completed, including

1. an on/off memory means including a flip-flop having a first state corresponding to a stop dialing instruction and a second state corresponding to a start dialing instruction, its output being connected for resetting said switch interrogation means in response to a stop state;

2. digital logic gates having inputs connected to said on/off memory means, said temporary coincidence memory, and said pulser and an output connected to the reset of said position interrogation means and to said enabling gate for preventing reset of said position interrogation means when said on/off memory means is in a stop state, for resetting said position interrogation means when simultaneously said on/off memory is in its start state said temporary coincidence memory is actuated and said dialer contacts are closed and for resetting said position interrogation means when said on/off memory switches from a stop state to a start state.

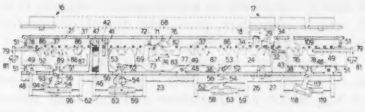


3,872,468
KEYBOARD FOR CALCULATING, ACCOUNTING AND OTHER OFFICE MACHINES

Nicolo Giolitti; Dante Daly, and Lorenzo Bertino, all of Ivrea, Turin, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Apr. 24, 1973, Ser. No. 354,052
Claims priority, application Italy, Apr. 28, 1972, 68316
Int. Cl. H04l *15/06*
U.S. Cl. 340—365 R **8 Claims**

1. Keyboard for calculating, accounting and other office machines, comprising a series of depressible keys, a group of shiftable code bars normally located in a rest position, mounting means for shiftably mounting said code bars in two working possitions located at opposite sides with respect to said rest position and equidistant therefrom, a series of setting elements each one operable by depressing a corresponding key of said series of keys for causing said code bars to be selectively shifted from said rest position to one of said working positions to define a code combination corresponding to the depressed key, and restoring means for restoring said code bars from the reached working position to the rest position upon releasing

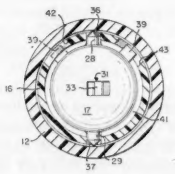


the depressed key, whereby the force required to depress any key is constant and indipendent of the working positions reached by said code bars.

3,872,469
MAGNETICALLY ACTUATED INDICATOR

Eugene F. Loughran, Jr., Oakville, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,493
Int. Cl. G08b *23/00*
U.S. Cl. 340—373 **7 Claims**



1. An electromagnetic device to indicate the presence of either a first condition or a second condition in a system, said device comprising:

a first housing structure;

a second housing structure movable back and forth in one direction with respect to said first housing structure and partially enclosed by said first housing structure and comprising, a rotatable member having integral stub axles to pivot approximately 170° between a first rest position to indicate said first condition and a second rest position to indicate said second condition in said system and comprising an elongated bar permanent magnet secured within and extending substantially diametrically across said rotatable member, an electromagnet comprising a coil and an elongated ferromagnetically soft core adjacent said permanent magnet whereby a magnetic field produced in said core by said coil interacts with said permanent magnet to rotate said rotatable member, and first and second juxtaposed units, said first juxtaposed unit comprising an open-ended receptacle for said rotatable member and said second juxtaposed unit comprising a cover fitting over said receptacle to enclose said rotatable member and having a transparent surface conforming to the surface of said rotatable member, at least one of said juxtaposed members having journal recesses open at the side facing the other of said juxtaposed members to receive said stub axles, said other of said juxtaposed members being positioned with respect to said recesses to capture said stub axles therein whereby said rotatable member is able to pivot between said first and second rest positions and remain in either of said rest positions, said second juxtaposed member comprising stop surfaces to engage said promontory stop at the ends of its range of travel;

permanent magnetic means affixed to said first housing structure;

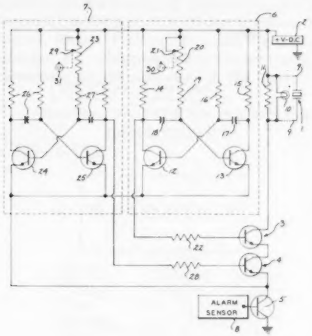
and spring biasing means pressing on said first and second housing structures to bias said core away from said permanent magnet, said second housing structure being

movable against said spring bias to bring said core sufficiently close to said permanent magnet to induce a predetermined magnetic field in said core to attract said rotatable member to a predetermined one of its rest positions.

3,872,470
AUDIBLE SIGNAL GENERATING APPARATUS HAVING SELECTIVELY CONTROLLED AUDIBLE OUTPUT

Richard D. Hoerz, and Donald J. Propp, both of Madison, Wis., assignors to Airco Inc., New York, N.Y.

Filed Apr. 18, 1973, Ser. No. 352,145
Int. Cl. G08b *19/00*
U.S. Cl. 340—384 E **15 Claims**



1. An audible signal generating circuit comprising a power source means, an electro-acoustical crystal transducer having a natural resonant frequency and generating an audible output of predetermined pitch and amplitude in response to electrical excitation at said resonant frequency and of a different pitch and lower amplitude in response to electrical excitation at a frequency above and below said resonant frequency, a non-sinusoid signal generator means establishing a periodic signal including a fundamental frequency and a plurality of harmonic frequencies and having an adjustable repetition rate selection means to selectively establish the output repetition rate of the signal generator and thereby select said fundamental frequency and harmonic frequencies, and a switch means coupling the transducer to the power source means and having an input means connected to said signal generator to selectively energize said transducer at the selected repetition rate and thereby establish an audible signal of a related pitch and of an amplitude which varies inversely with the difference between said resonant frequency and said fundamental frequency.

3,872,471
PULSING BELL HAVING RECTIFIER CIRCUIT

Nicholas W. F. Bird, and Chang-Whan Kim, both of Owen Sound, Ontario, Canada, assignors to General Signal Corporation, Rochester, N.Y.

Filed May 21, 1973, Ser. No. 362,643
Int. Cl. G08b *3/10*
U.S. Cl. 340—384 R **8 Claims**

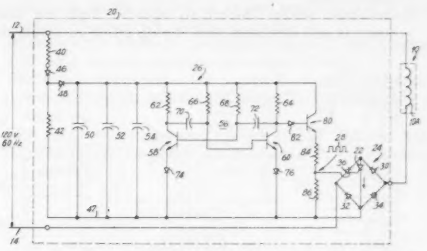
1. A unitary alarm indicating device adapted to be intermittently operated from an AC power supply, comprising:

a. an actuator device including a housing therefore,

b. an actuator circuit enclosed within said actuator housing, said actuator circuit including,

1. a control device having an anode, cathode and gate,

2. an electronic triggering circuit for producing a series of square wave pulses for effectuating intermittent operation of said actuator, said triggering circuit having its output connected to the gate of said control device, and

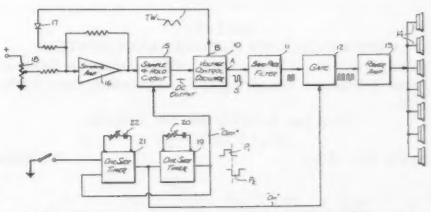


3. a rectifier circuit connecting said AC power supply to the anode and cathode of said control device.

3,872,472
ULTRASONIC SYSTEM FOR REPELLING NOXIOUS FAUNA

Robert G. Moschgat, Shunnock Woods, North Stonington, Conn. 06359

Filed Dec. 11, 1973, Ser. No. 423,759
Int. Cl. A01m *29/00*; **G10k** *10/00*
U.S. Cl. 340—384 E **11 Claims**



1. An electronic system for permanently repelling rodents and other forms of noxious fauna, said system comprising:

A. means including a voltage-controlled oscillator to produce an ultrasonic signal whose frequency lies in a range above the human hearing range to which the fauna are highly sensitive;

B. at least one ultrasonic transducer,

C. means intermittently to apply said signal from said oscillator to said transducer for brief intervals whereby pulses of ultrasonic energy are radiated by the transducer; and

D. means to apply to said oscillator during said intervals held voltages having random values, said oscillator thus generating a signal of ultrasonic pulses having random frequencies such that rodents and other noxious fauna are unable to acquire deafness immunity.

3,872,473
MONITORING APPARATUS

Hans Melgaard, Minneapolis, and Nile E. Plapp, Bloomington, both of Minn., assignors to Despatch Industries, Inc., Minneapolis, Minn.

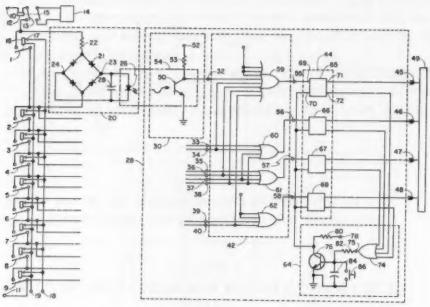
Filed Oct. 23, 1973, Ser. No. 408,722
Int. Cl. G08b *19/00*
U.S. Cl. 340—415 **8 Claims**

1. A monitoring system for determining which relay contact is the first to drop out of a circuit having a plurality of relay contacts connected in series across a voltage source, the system comprising:

a plurality of detectors for sensing the dropping out of the relay contacts and for producing output signals in response thereto, with a separate detector associated with and connected in parallel across each relay contact, each detector producing an optical detector output signal in

response to the dropping out of its associated relay in response to the dropping out of its associated relay contact; and

binary logic means electrically isolated from the relay contacts and detectors, and having photo receiving de-



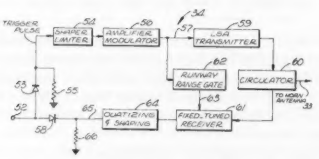
vices for receiving the optical detector output signals from the detectors through an optical connection and for responding to the detector output signals by producing a binary display signal indicative of which relay contact was the first to drop out.

3,872,474

AIRPORT GROUND SURVEILLANCE SYSTEM

Arnold M. Levine, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,089
Int. Cl. G01s 9/04
U.S. Cl. 343—5 LS **9 Claims**



1. A system for airport surface traffic control on at least one runway, comprising:

a plurality of low-power pulsed transmit-receive radar devices spaced along a line parallel to and laterally offset from said runway, each of said devices having a transmit-receive pattern extending over a discrete portion of said runway and each being responsive to timing pulses to transmit corresponding short microwave pulses contemporaneously;

a timing pulse generator for generating timing pulses of a first polarity at a predetermined PRF;

transmission line means connected from said pulse timing generator to supply said pulses to said radar devices serially in a predetermined order, the time of arrival of said timing pulses at each of said radar devices being determined by the length of said transmission line thereto from said timing pulse generator;

reception means within each of said radar devices for receiving echo signals corresponding to said microwave pulses and for sending said echo signals in a second polarity into said transmission line; and

display means connected to said transmission line at a point removed from said radar devices and connected to be synchronized by said timing pulse generator and to visually display the positional data represented by said echo signals.

3,872,475

METHOD AND APPARATUS FOR MEASURING DISTANCE TO MOVING TARGET

Teruo Yamanaka, Nagoya, and Kazuo Sato, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed Dec. 29, 1972, Ser. No. 319,472
Claims priority, application Japan, Dec. 31, 1971, 47-2476
Int. Cl. G01s 9/24
U.S. Cl. 343—14 **13 Claims**

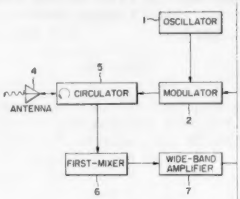
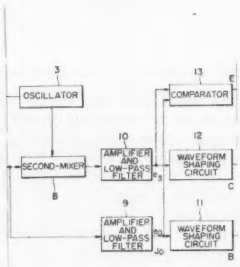
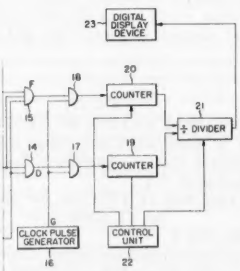


FIG. 6A FIG. 6B FIG. 6C





1. A distance measuring method utilizing transmitted and reflected frequency-modulated continuous waves comprising, mixing a transmitted wave and a reflected wave so as to derive a low frequency wave,

separating a first Doppler signal from said low frequency wave, separating a fundamental wave component and harmonic wave components from said low frequency

wave, and separating additional Doppler signals therefrom, and selecting at least two Doppler signals from said first and additional Doppler signals which are different in phase from each other,

detecting a reference time of one of said selected Doppler signals in one period,

detecting a time when the intensities of said selected Doppler signals are equal to each other in one period,

detecting a time interval between said reference time and said time when the intensities of said selected Doppler signals are equal to each other in one period,

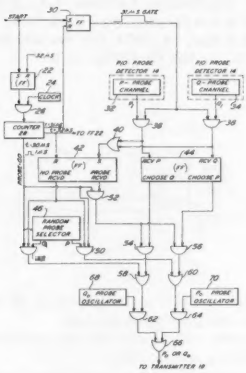
calculating a ratio between said time interval and a period of said selected Doppler signals thereby measuring a distance to a target.

3,872,476

FRUIT REDUCTION BY PROBE SELECTION

Oscar Shames, Cherry Hill, N.J.; James L. Hinds, Telford, Pa.; Michael G. Raditz, Furlong, Pa., and Gerald J. Palatucci, Warminster, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 23, 1973, Ser. No. 418,694
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 LC **5 Claims**



1. A probe selector comprising:

clock means for producing periodic signals;

counter means responsive to a START signal for counting said periodic signals and for producing at least three counting interval signals T_1, T_2 and T_3;

gate generator means responsive to said START signal and to said signal T_2 for producing a gate signal of predetermined duration;

first means responsive to a P probe and to said gate signal for producing a signal P_1;

second means responsive to a Q probe and to said gate signal for producing a signal Q_1;

first memory means responsive to said P_1 signal or to said Q_1 signal for storing said signals and for generating a choose-Q signal when said P_1 signal is stored and for generating a choose-P signal when said Q_1 signal is stored;

second memory means responsive to said P_1 signal or to said Q_1 signal for registering the occurrence of said P_1 signal or said Q_1 signal and for producing a probe-received signal upon such occurrence, said second memory means being also responsive to said counting interval signal T_3 and arranged to register the occurrence of said signal T_3 and to produce a NO-probe-received signal upon registration of said signal T_3;

first gate means responsive to said probe received signal and to said signal T_1 for producing a signal X;

second gate means responsive to said signal X and to said signal choose-Q for producing a signal Y;

third gate means responsive to said signal X and to said signal choose-P for producing a signal Z;

probe selector means for producing a signal Q′ and a signal P′ on a mutually exclusive and random basis;

fourth gate means responsive to said Q′, to said NO-probe-received signal, and to said signal T_1 for producing a signal A;

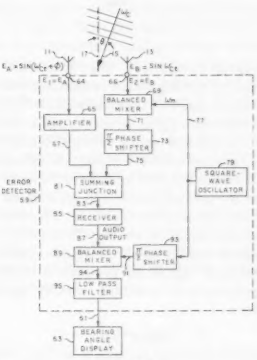
fifth gate means responsive to said signal P′, to said NO-probe-received signal, and to said signal T_1 for producing a signal B.

3,872,477

DIRECTION FINDING TECHNIQUES EMPLOYING ELECTRONIC PHASE MODULATION

John P. King, Mountain View, Calif., assignor to ESL Incorporated, Sunnyvale, Calif.

Filed July 19, 1972, Ser. No. 273,151
Int. Cl. G01s *3/02, 5/04*
U.S. Cl. 343—120 **23 Claims**



1. A method of determining a bearing signal of an electromagnetic energy wavefront relative to two receiving antennas, comprising the steps of:

modulating an electrical signal from one of said antennas with a modulating signal of constant frequency in order to generate a pair of sidebands with carrier suppressed,

adding the modulated signal to an electrical signal from the other of said antennas to form a composite signal, and

generating an error signal proportional to the degree of phase or amplitude modulation of said composite signal and thereby also proportional to the bearing angle of said electromagnetic energy wavefront, said error signal generation including the steps of:

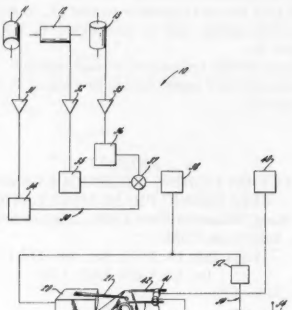
applying the composite signal to an antenna input of a frequency modulation responsive radio receiver, thereby detecting the degree of phase modulation of said composite signal, and

utilizing an audio output of said receiver for indicating the bearing angle.

3,872,478
THREE DIMENSIONAL SEISMOGRAPH

Spencer W. Lucole, Evanston, Ill., assignor to Nitro-Nobel A.B., Stockholm, Sweden

Filed June 14, 1974, Ser. No. 479,420
Int. Cl. G01d *9/32*
U.S. Cl. 346—7 3 Claims

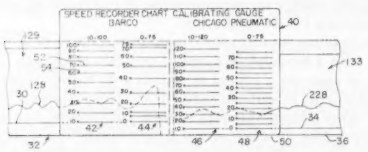


1. A seismograph comprising, in combination, three linear velocity transducers having shock responsive axes disposed at relative right angles, each of said transducers being capable of developing an electrical signal proportional to the energy of a velocity wave component acting along the respective axis of the transducer, a strip recorder having a stylus driven by an actuator which moves the stylus proportionally to an electrical signal received by said actuator, and an electric circuit coupling said transducers and said recorder actuator, said circuit including means for squaring the signals from the transducers, algebraically summing the squared signals, taking the square root of the summed signals to produce a resultant velocity signal, and applying said resultant velocity signal to the recorder actuator.

3,872,479
METHOD AND APPARATUS FOR RECORDING AND RETRIEVING RAILROAD LOCOMOTIVE SPEED DATA

William K. Ramsey, 253 Christine Dr., Decatur, Ill. 62526

Filed June 1, 1972, Ser. No. 258,858
Int. Cl. G07c *23/00*
U.S. Cl. 346—1 7 Claims



1. An improved method of recording and retrieving locomotive speed data utilizing a common elongated tape record medium which accomodates and is compatible with a plurality of different kinds of locomotive speed recorders that differ from each other in that they respectively produce a speed plot on said elongated tape record medium based on different speed scales or speed scale orientations, said method comprising:

installing said common elongated tape record medium on any given one of said plurality of different kinds of locomotive speed recorders;

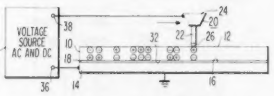
producing a speed plot on said elongated tape record medium of the speed conditions experienced by said locomotive in accordance with the characteristics of said given one of said plurality of different kinds of locomotive speed recorders; and,

retrieving the speed recorded by said given locomotive speed recorder on said elongated tape record medium by utilizing an overlay having a plurality of separate sets of speed calibration indicia, each set of which respectively corresponds to one of said plurality of different kinds of locomotive speed recorders, said overlay and said tape record medium each being provided with alignable registration means for registering the appropriate set of said separate sets of speed calibration indicia on said overlay with said speed plot to provide the user thereof with a readout of the speed information represented by said speed plot.

3,872,480
METHOD OF ELECTROSTATIC RECORDING ON ELECTRICALLY INSULATING FILMS BY NON-WETTING ELECTRICALLY CONDUCTIVE LIQUIDS

Rudolf Succo Engelbrecht, Langnau A.A., Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,093
Int. Cl. G03g *13/10*
U.S. Cl. 346—74 ES 13 Claims



1. A method of electrostatic recording on an electrically insulating film comprising the steps of:

wetting a probe with an electrically conductive liquid that is non-wetting on said film,

applying a source of voltage between one major surface of said film and said probe, and

applying relative motion between said probe and the other major surface of said film so that said liquid comes into only non-wetting contact with selected areas of said opposite major surface, said liquid adhering only to said probe and moving therewith, whereby to apply electrostatic charges to said selected areas.

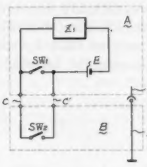
3,872,481
REMOTE CONTROL OF CAMERA BUILT-IN LIGHT MEASURING DEVICE

Koichiro Watanabe, Funabashi, and Akihiro Arai, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 31, 1973, Ser. No. 393,394
Claims priority, application Japan, Sept. 7, 1972, 47-103641
Int. Cl. G03b *17/00*, *17/38*
U.S. Cl. 354—23 2 Claims

1. A switching device of an electric circuit for light measuring used with a photographic camera to be utilized for photometric indication or automatic exposure control, comprising a first switch arranged within a camera body to activate said electric circuit for light measuring and a second switch arranged outside the camera body in parallel circuit relationship

with the first switch, so that the second switch is operative to activate said electric circuit for light measuring within the



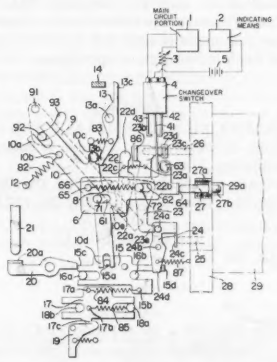
camera body so that operation of light measuring may be remote controlled.

3,872,482

MEASURING SYSTEM SWITCHING MEANS FOR SINGLE LENS REFLEX CAMERA

Kazuhiro Akiyama, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya-shi, Japan

Filed Nov. 9, 1973, Ser. No. 414,445
Claims priority, application Japan, Dec. 4, 1972, 47-121764
Int. Cl. G03b *7/20*
U.S. Cl. 354—46 **23 Claims**



1. In a single lens reflex camera including a full-aperture measuring circuit and a stopped-down measuring circuit, a switch means for selectively energizing one of said circuits comprising:

a changeover switch means selectively closing one of said circuits,

a movable pin provided on the lens mount of the camera so as to be moved by the lens barrel of a stopped-down measuring type lens from a first position to a second position, said movable pin being associated with said changeover switching means so as to close said full-aperture measuring circuit and open said stopped-down measuring circuit when the movable pin is in said first position and open both said full-aperture measuring circuit and said stopped-down measuring circuit when the movable pin is in said second position, and

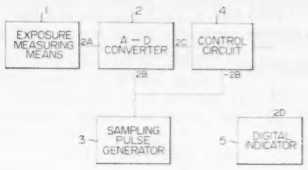
a manually operable stop-down pin provided in the camera so as to be manually moved from a first position in which the aperture of the lens is fully open to a second position in which the aperture of the lens is stopped down, said stop-down pin being associated with said changeover switching means so as to close said full-aperture measuring circuit when the stop-down pin is in the first position and open said full-aperture measuring circuit and close said stopped-down measuring circuit when the stop-down pin is in said second position.

3,872,483

DEVICE FOR INDICATING DIGITAL EXPOSURE INFORMATION IN THE VIEWFINDER OF A CAMERA

Saburo Numata, Urawa; Iwao Sagara, and Hirohisa Shishikura, both of Tokyo, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Omija-shi and Oki Electric Industry Co., Ltd., Tokyo, both of Japan

Filed July 29, 1974, Ser. No. 492,909
Claims priority, application Japan, July 28, 1973, 48-85167
Int. Cl. G01j *1/00*
U.S. Cl. 354—53 **5 Claims**



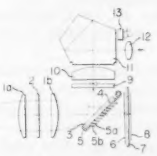
1. A device for indicating digital exposure information in the viewfinder of a camera comprising an exposure measuring means including a photodetector to receive light from the object to be photographed and generating an analogue output corresponding to the amount of light received by the photodetector, an A-D converter connected with the exposure measuring means for converting said analogue output to a digital output, a sampling pulse generating means connected with the A-D converter for giving sampling pulses to the A-D converter to determine the sampling intervals of A-D conversion of the A-D converter, a digital information indicating means including light emitting segments arranged in the shape of numerals for indicating exposure information in a digital form, and a control circuit connected with said A-D converter, said sampling pulse generating means and said digital information indicating means for converting the digital output from the A-D converter to a signal for selectively energizing said light emitting segments to indicate the digital output in a digital form, the period of said sampling pulses being equal to or longer than 0.2 second.

3,872,484

METERING DEVICE FOR A SINGLE LENS REFLEX CAMERA

Teiji Hashimoto, Kawasaki; Takehiko Kiyohara, Zama; Takashi Uchiyama; Tokuichi Tsunekawa, both of Yokohama; Masamichi Kakunodate, and Soichi Nakamoto, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1974, Ser. No. 471,188
Claims priority, application Japan, May 24, 1973, 48-58370
Int. Cl. G03b *7/08, 19/12*
U.S. Cl. 354—59 **3 Claims**



1. A metering device for a single lens reflex camera having a movable mirror therewithin, said device comprising a metering element held on the back side of said movable mirror, and an incident light direction restricting structure formed on the

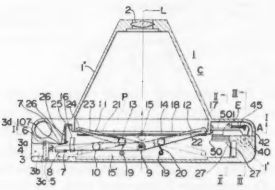
light-sensing surface of said metering element, said restricting structure being inclined with respect to the light-sensing surface of said metering element so that it may intercept direct light from the picture-taking lenses of the camera in raised raised position of said movable mirror so as to permit only the reflected light from the surface of a film or of a shutter curtain to be passed to said metering element.

3,872,485

AUTO-PROCESS CAMERA HAVING SELECTIVELY INSERTABLE SELF DEVELOPING FILM SHEETS

Yoshio Asano, Hyogo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kangawa, Japan

Filed Nov. 6, 1973, Ser. No. 413,306
Claims priority, application Japan, Nov. 6, 1972, 47-111514
Int. Cl. G03b *17/50*
U.S. Cl. 354—83 **7 Claims**



1. An auto-process camera comprising

a body forming a main camera interior and a lens housing portion,

a rectangular entrance provided in the side of the body through which at least one sheet of film protected by a light-proof envelope is slidably inserted into the camera interior as far as a set position in light-proof condition, the envelope being automatically broken off upon insertion of film into the camera interior,

a means for sealing the entrance of the body to prevent light from entering into the camera interior in normal condition, and permitting insertion of film into the camera interior,

a means for holding and automatically advancing sheets of film in succession from the set position to a foremost position for exposure thereof through the lens,

a means operating cooperatively with said holding and advancing means to permit introduction of film from the entrance of the body to the set position, and

a means for automoatically removing successively exposed sheets of film from the camera.

3,872,486

PHOTOGRAPHIC APPARATUS EMPLOYING VARIABLE PRESSURE PLATE STRUCTURE

Peter A. Scibilia, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

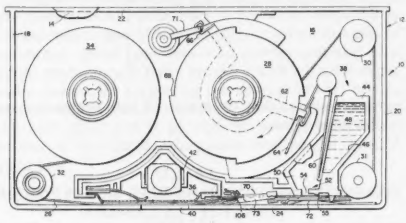
Filed Dec. 19, 1973, Ser. No. 426,127
Int. Cl. G03b *17/50*
U.S. Cl. 354—88 **15 Claims**

1. A photographic film handling cassette for use with other apparatus for first exposing a strip of photographic film material and for subsequently projecting images recorded on such film strip, said casette comprising:

a housing for retaining such film strip, said housing including an opening for exposing progressive incremental sections of such film strip;

means responsive to drive means of such other apparatus for advancing such film along a given path within said housing, said given path traversing said opening with one surface of such film strip facing inwardly of said housing;

a pressure plate assembly located within said housing at said opening for supporting substantially the full width of such incremental sections in a predetermined focal location as such sections are progressively located in said opening, said pressure plate assembly including a plate having an aperture extending therethrough and terminating in at least a pair of laterally spaced apart surfaces configured for engaging the longitudinal margins of such



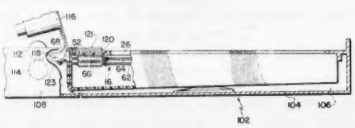
film strip and a displaceable member mounted for displacement between a first position wherein one surface of said member complements said laterally spaced apart surfaces to provide a substantially smooth support for substantially the entire width of such film strip where it is disposed across such predetermined focal location to facilitate exposure operations and a second position wherein said member does not serve to cover said aperture to facilitate projection operations.

3,872,487

PHOTOGRAPHIC FILM ASSEMBLAGE AND APPARATUS

Nicholas Gold, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 213,989, Dec. 30, 1971, Pat. No. 3,748,984. This application July 30, 1973, Ser. No. 383,777
Int. Cl. G03b *17/52*
U.S. Cl. 354—86 **17 Claims**



1. Photographic apparatus for use with a photographic film assemblage of the type including a film container housing at least one film unit and having a withdrawal slot at one end thereof through which the film unit may be extracted from the container and an end cap coupled to the container for movement between an initial closed position in which the end cap is in alignment with and in closing relation to the withdrawal slot and an open position in which the end cap is out of alignment with the withdrawal slot, the end cap being configured to include a portion extending outwardly from the container when the end cap is located in the initial closed position, said photographic apparatus comprising:

a housing;

means defining a fixed exposure position within said housing wherein such a film container is adapted to be located to expose film units held in the film container;

means associated with said housing for receiving and supporting such a film container at said fixed exposure position with the end cap on the film container located in the initial closed position; and

means mounted on said housing for movement relative to such a film container supported at said fixed exposure position for engaging the portion of the end cap extending

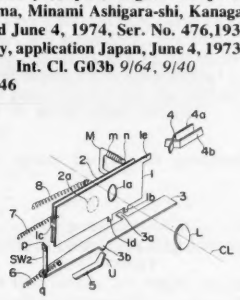
outwardly from the film container and moving the end cap from the initial closed position to the open position.

3,872,488

ELECTRONIC SHUTTER MEANS

Shigeru Oshima, Tokyo, Japan, assignor to Fuji Photo Film Co. Ltd., Nakanuma, Minami Ashigara-shi, Kanagawa, Japan

Filed June 4, 1974, Ser. No. 476,193
Claims priority, application Japan, June 4, 1973, 48-62683
Int. Cl. G03b 9/64, 9/40
U.S. Cl. 354—246 2 Claims



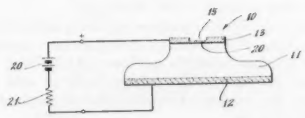
1. In a guillotine type electronic shutter comprising a first curtain, a cocking means, which, when moved to set position, moves said first curtain to a cocked position, a second curtain, which is moved to a cocked position by said first curtain, and an electromagnetic means, which is actuated by an electronic shutter control circuit to temporarily retain said second curtain in a cocked position upon return of said cocking means from said set position, an electronic shutter means comprising a clamp means, which may engage said first curtain when said first curtain is moved to said cocked position, and retain said first curtain in said cocked position upon start of return of said cocking means from said set position, and a mechanical means, which is provided between said first curtain and said cocking means, and which is actuated to forcibly disengage said first curtain from said clamp means, after said cocking means has returned a certain distance from said set position, whereby exposure time determined by said control circuit is shortened by a certain time.

3,872,489

ELECTRON EMISSION FROM A COLD CATHODE

Arno K. Hagenlocher, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 22, 1973, Ser. No. 335,273
Int. Cl. H01l 3/08
U.S. Cl. 357—15 7 Claims



1. A cold cathode electron emitter using double injection space-charge limited current, comprising:

a single semiconductor body, said single body consisting of a homogeneous P-type wide bandgap material;

first and second conductor plates mounted on opposite sides of said single semiconductor body, said second plate being formed with an aperture defining an electron emitting surface of said single semiconductor body;

a thin layer of work function reducing material coated on said electron emitting surface;

bias voltage means connected across said plates, said voltage at said second plate being more positive than said voltage at said first plate; and

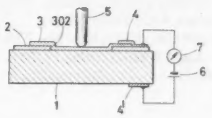
said single semiconductor body having a thickness measured between said plates, a lifetime and a thermal carrier concentration and said bias means having a magnitude such that said single semiconductor body and said means produce double injection space-charge limited current within said single semiconductor body in which electrons are injected from said first plate and holes are injected from said second plate to excite electrons into the conduction band of said single semiconductor body.

3,872,490

MECHANICAL - ELECTRICAL SEMICONDUCTOR TRANSDUCER WITH RECTIFYING TIN OXIDE JUNCTION

Kazuhiro Higashi, Takatsuki; Isao Taguchi, and Nobuaki Miura, both of Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 26, 1971, Ser. No. 119,337
Claims priority, application Japan, Nov. 16, 1970, 45-114087; Jan. 20, 1971, 46-1515
Int. Cl. H01l 11/00, 15/00
U.S. Cl. 357—15 25 Claims



1. A semiconductive mechanical-electrical transducer comprising:

a semiconductor composite including a semiconductor substrate formed of Si, Ge, or GaAs; and a film of tin oxide deposited on said semiconductor substrate and forming a barrier having a rectifying characteristic therebetween; and

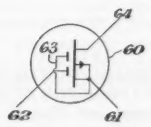
means for applying mechanical force to said composite.

3,872,491

ASYMMETRICAL DUAL-GATE FET

John W. Hanson, Salt Lake City, Utah, and John D. MacDougall, Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Mar. 8, 1973, Ser. No. 339,270
Int. Cl. H01l 5/06, 19/00
U.S. Cl. 357—23 1 Claim



1. A dual gate field effect transistor comprising a semiconductor body of one conductivity type; spaced first, second and third low resistivity regions of the opposite conductivity type lying within said body and adjacent to a common surface of said body, said spaced regions constituting the source, the virtual source-drain and the drain regions respectively, a first conductive channel region being defined by the space be-

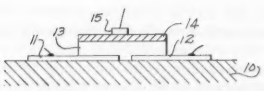
tween said source and said virtual source-drain; a second channel region being defined by the space between said virtual source-drain and said drain, said second channel region containing a greater concentration of dopant impurities of said opposite type than said first channel region, or said first channel region containing a greater concentration of dopant impurities of said one type than said second channel, or both; an insulating layer covering at least the portions of said surface adjacent to said first and second channels; a first gate electrode on said insulating layer extending over said first channel; a second gate electrode on said insulating layer extending over said second channel; a metal conductor making ohmic connection between an undoped region in said body and said low resistivity source region and being further connected to said second gate electrode; and a protective outer package having first, second and third electrical terminals accessible external to said package, said terminals being connected internal to said package with said source, said first gate electrode and said drain, respectively, such that with a zero bias voltage applied between said first gate and said source, said second channel is more conductive than said first channel.

3,872,492

RADIATION HARDENED FIELD EFFECT TRANSISTOR

Lionel Robbins, Orchard Lake, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed July 26, 1972, Ser. No. 275,138
Int. Cl. H01 *5/06, 11/14*
U.S. Cl. 357—23 **21 Claims**



1. A radiation hardened field effect transistor including a semiconductor element, a source and a drain at spaced apart points along the semiconductor element, a gate for the semiconductor element for controlling current through the semiconductor element between the source and drain and an insulator between the gate and the semiconductor element, wherein said insulator comprises an amorphous non-oxidic insulating semiconductor material comprising a saturated cross-linked alloy glass selected from the group consisting of chalcogenides, arsenides and phosphides having substantially no deep traps so that charges caused by external radiation are not trapped therein and internal fields due to such charges are substantially immediately neutralized in said insulator.

3,872,493

SELECTIVE IRRADIATION OF JUNCTIONED SEMICONDUCTOR DEVICES

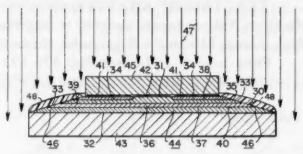
John S. Roberts, Export, and Michael W. Cresswell, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 25, 1972, Ser. No. 283,684
Int. Cl. H01 *11/10, 15/00*
U.S. Cl. 357—29 **6 Claims**

1. A thyristor device comprising:

a. a silicon semiconductor body having a blocking PN junction therein; and

b. a peripheral portion of the body having been irradiated with radiation means and a bulk portion of the body having been nonirradiated with said radiation means by masking said bulk portion against irradiation to increase the blocking voltage across the body without substantively increasing the forward voltage drop across the body.

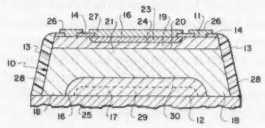


3,872,494

FIELD-CONTOURED HIGH SPEED, HIGH VOLTAGE TRANSISTOR

John R. Davis, Jr., Export, Pa., and Surinder Krishna, Ballston Lake, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 8, 1974, Ser. No. 440,934
Int. Cl. H01 *11/06*
U.S. Cl. 357—34 **5 Claims**



1. A transistor having high voltage and high speed capability comprising:

A. a semiconductor body having first and second opposed major surfaces, a resistivity therethrough or at least about 30 ohm-cm and a thickness of at least about 100 microns;

B. an emitter region of a given conductivity type positioned in the body adjoining selected internal portions of the first major surface;

C. a collector region of conductivity type the same as the emitter region positioned in the body adjoining the second major surface and comprising a first collector portion and a second collector portion;

D. said first collector portion adjoining selected internal portions of the second major surface and having a surface impurity concentration at the second major surface greater than about 8×10^{18} atoms/cm^3.

E. said second collector portion adjoining selected peripheral portions of the second major surface contiguously around the first collector portion and adjoining the first collector portion interior of the body at said internal portions, and having a resistivity therethrough of greater than 30 ohm-cm;

F. said second collector portion at said internal portions having a substantially uniform thickness of at least about 30 microns and a reach-through voltage less than the avalanche breakdown voltage thereof, and said second collector portion at said peripheral portions having a thickness at least 20 percent greater than the thickness of second collector portion at said internal portions and having a width at the second major surface greater than the width of the second collector portion at said internal portions;

G. a base region of conductivity type opposite from the emitter and collector regions positioned at least partially interior of the body between the emitter region and the second collector portion of collector region and forming separate PN junctions therewith, and having a minority

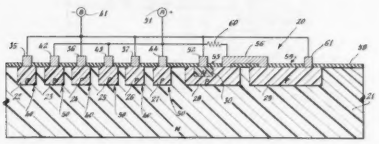
carrier diffusion length at least on the order of magnitude greater than the thickness of the base region at the internal portions of the body; and

H. metal contacts affixed to the major surfaces of the body to make separate ohmic contact with emitter, collector and base regions.

3,872,495
NEGATIVE IMPEDANCE CONVERTER

William L. Geller, and Jeremiah P. McCarthy, both of Framingham, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed June 11, 1973, Ser. No. 369,043
Int. Cl. H01l *19/00*
U.S. Cl. 357—48 **5 Claims**



1. A semiconductor negative impedance converter module having only an input and an output terminal comprising:

a. a semiconductor substrate of a first conductivity type;

b. first, second, and third regions of a second conductivity type formed completely within such substrate, said first and second regions each having outer dimensions defining a continuous volume of material of said second conductivity type and said regions being separated within said substrate;

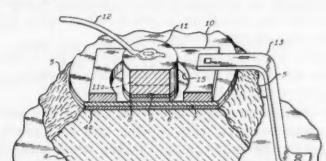
c. a fourth region of said first conductivity type formed within said third region, said fourth region having outer dimensions defining a continuous volume of material of said first conductivity type; and

d. first, second, third and fourth spaced electrodes conductively contacting said first, second, third and fourth regions respectively.

3,872,496
HIGH FREQUENCY DIODE HAVING SIMULTANEOUSLY FORMED HIGH STRENGTH BONDS WITH RESPECT TO A DIAMOND HEAT SINK AND SAID DIODE

Curtis N. Potter, Holliston, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 13, 1973, Ser. No. 396,960
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 357—81 **5 Claims**



1. In a high frequency semiconductor device,

diamond heat conductor means having first and second opposed substantially parallel flat polished surfaces,

first and second high electrical and thermal conductivity metal layers bonded separately to said respective first and second opposed substantially parallel flat polished surfaces,

massive heat sink means bonded to said first metal layer,

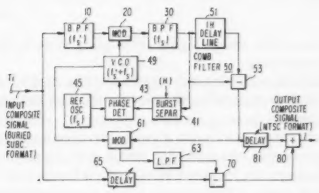
preformed apertured plate means bonded to said second metal layer simultaneously with the bonding of said massive heat sink means to said first metal layer, and

active semiconductor means bonded substantially concentrically within said aperture to said second metal layer within said aperture.

3,872,497
SIGNAL TRANSLATING APPARATUS FOR COMPOSITE SIGNAL SUBJECT TO JITTER

John Gordon Amery, and Robert Warren Jorgenson, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 13, 1973, Ser. No. 351,036
Int. Cl. H04n *9/12*
U.S. Cl. 358—4 **15 Claims**



1. A color image signal translating system comprising, in combination:

means for providing an input composite signal including (a) a signal representative of the chrominance of a color image and occupying only a given frequency band, and (b) a signal representative of the luminance of said color image and including a first luminance signal portion occupying said given frequency band and additional luminance signal portions having frequencies outside said given frequency band; said first luminance signal portion including signal components normally subject to occupancy of only a first plurality of regularly spaced spectral locations extending over said given frequency band, and said chrominance signal including signal components normally subject to occupancy of only a second plurality of spectral locations interleaved with said first plurality; said composite signal providing means being subject to abnormal operation causing spurious variations of the frequencies of said signal components about said normally occupied spectral locations;

a source of oscillations

means for varying the frequency of the oscillations provided by said source about a nominal value in synchronism with said spurious variations during abnormal operation of said composite signal providing means;

means for heterodyning oscillations provided by said source with at least the portion of said composite signal occupying said given frequency band;

means for deriving an output from said heterodyning means inclusive of a frequency shifted chrominance signal occupying a frequency band different from said given frequency band, and a frequency shifted luminance signal portion corresponding to said first luminance signal portion and sharing said different frequency band;

and a comb filter responsive to said output derived from said heterodyning means for passing said frequency shifted chrominance signal to the substantial exclusion of said frequency shifted luminance signal portion.

3,872,498

COLOR INFORMATION TRANSLATING SYSTEMS

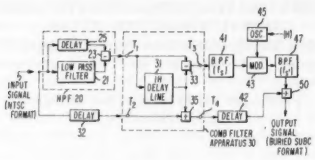
Dalton Harold Pritchard, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 13, 1973, Ser. No. 350,777

Claims priority, application Great Britain, Apr. 19, 1972, 18036/72

Int. Cl. H04n *9/02*

U.S. Cl. 358—21 **25 Claims**



1. In a color image signal translating system, the combination comprising:

means for developing signals representative of only the chrominance of said color image and occupying only a given frequency band;

means for developing signals representative of only the luminance of said color image and occupying a band of frequencies inclusive of said given frequency band as well as a band of frequencies lower than and adjacent to said given frequency band;

means for processing the luminance representative signals developed by said luminance representative signal developing means to effect signal component removal at a plurality of spectral locations regularly spaced throughout said given frequency band while passing substantially all signal components thereof falling within said lower frequency band;

comb filter means responsive to the chrominance representative signals developed by said chrominance representative signal developing means for substantially confining said chrominance representative signals to components at said plurality of regularly spaced spectral locations; and means for combining the outputs of said luminance representative signal processing means and said comb filter means to form a composite signal inclusive of luminance representative signal components falling within said lower frequency band and in which luminance representative signal components and chrominance representative signal components share said given frequency band in substantially non-overlapping, interleaved relationship.

3,872,499

TELEVISION PICTURE CORRECTION

Eric Douglas McConnell, and Joseph Colin Whitehouse, both of Leicester, England, assignors to The Rank Organisation Limited, London, England

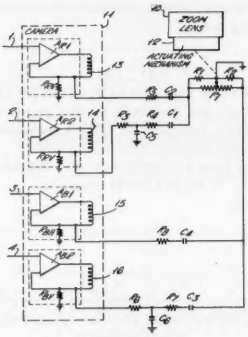
Filed Aug. 2, 1973, Ser. No. 384,946

Claims priority, application United Kingdom, Aug. 25, 1972, 39774/72

Int. Cl. H04n *9/10*

U.S. Cl. 358—51 **11 Claims**

1. In a television camera having a zoom lens, a plurality of pickup tubes arranged to receive colour separation images and scan control means for controlling the scan of each pickup tube to form a raster of a given size the improvement which comprises means providing a signal representing the value of an operational parameter of the zoom lens and compensating circuit means for receiving said signal and modifying said scan control means to alter the raster size of at least one said pickup tube under control of said signal whereby the rasters in the pickup tubes maintain the same size relative to each other irrespective of changes in said operational parameter of the zoom lens.



3,872,500

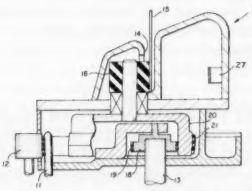
TWO-SPEED DRIVE FOR LINEAR ADAPTER FOR CASSETTE TAPE RECORDER

Albert F. Wild, Rochester, N.Y., assignor to Tapecon, Inc., Rochester, N.Y.

Filed May 21, 1973, Ser. No. 362,428

Int. Cl. G11b *23/94*; **G06k** *7/08*

U.S. Cl. 360—2 **5 Claims**



1. A two-speed drive for a linear adapter for a cassette tape recorder having a capstan, a pinch roller, and a driven take-up shaft, said driving comprising:

a. a drive wheel having a central opening for fitting over said take-up shaft to turn with said take-up shaft;

b. a pulley driven by said drive wheel;

c. an endless belt passing around said pulley and over said capstan between said capstan and said pinch roller to regulate the speed of said pulley when said pinch roller presses said belt against the capstan;

d. means for tensioning and guiding said belt over said capstan;

e. a friction roller coaxial with said pulley and turning with said pulley at a regulated speed when said pinch roller presses said belt against said capstan and at a faster speed when said pinch roller is clear of said belt and said capstan;

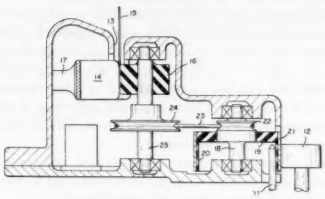
f. a linear drive slot approximately tangent to said friction roller; and

g. means for pressing a linear recording element against said friction roller for traversing said slot.

3,872,501
DRIVE FOR A LINEAR PLAY ADAPTER FOR A CASSETTE TAPE RECORDER

Donald F. McPherson, Hilton, N.Y., assignor to Tapecon, Inc., Rochester, N.Y.

Filed May 24, 1973, Ser. No. 363,320
Int. Cl. G11b *25/04, 23/04*
U.S. Cl. 360—2 **10 Claims**

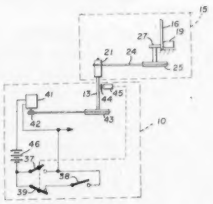


1. A drive for an adapter removably insertable in a tape recorder having a capstan and a pinch roller, said drive comprising:
   a. a driven element including a shaft rotatably supported on said adapter;
   b. a resilient elastomeric hub fixed to said shaft and extending radially outwardly from said shaft;
   c. a substantially rigid cylindrical sleeve secured to the periphery of said elastomeric hub and extending axially from said elastomeric hub;
   d. a layer of friction material on the inside of said axial extent of said cylindrical sleeve;
   e. drive means turned by said driven element for operating said adapter; and
   f. said elastomeric hub and said cylindrical sleeve being configured so said sleeve is engaged by said pinch roller to press said friction material aganist a substantial length of said capstan with said sleeve providing uniform and unyielding control of the speed transfer from said capstan and said elastomeric hub flexing to accommodate any discontinuity of said capstan and said pinch roller relative to said shaft while transmitting true capstan speed without variation.

3,872,502
SIMULTANEOUS CARD AND CASSETTE RECORDER SYSTEM

Albert F. Wild, Rochester, N.Y., assignor to Tapecon, Inc., Rochester, N.Y.

Filed May 24, 1973, Ser. No. 363,321
Int. Cl. G11b *5/00, 25/04*
U.S. Cl. 360—2 **5 Claims**

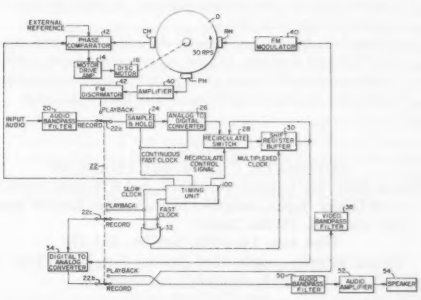


1. A simultaneous card and cassette recorder system comprising:
   a. a tape recorder for said cassette, said recorder having a capstan for a tape drive for said cassette, a magnetic head for tracking said tape in said cassette, switches and amplifier circuitry;
   b. an adapter for said card, said adapter being configured to be superposed over the region normally occupied by said cassette in said recorder so that said cassette and said adapter can both be operably placed on said recorder simultaneously;
   c. said capstan extending through said cassette region and into the region of said adapter superposed over said cassette region;
   d. means driven by said capstan in said adapter for moving said card through said adapter:
   e. a magnetic head in said adapter for tracking a path on said card; and
   f. said switches being arranged for connecting said magnetic head of said recorder and said magnetic head of said adapter selectively with said amplifier circuitry for recording or playing said card or said cassette, or simultaneously recording or playing both said card and said cassette.

3,872,503
ELIMINATION OF TRANSIENTS IN PROCESSING SEGMENTS OF AUDIO INFORMATION

Harold B. Shutterly, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 23, 1974, Ser. No. 435,782
Int. Cl. G11b *5/00*
U.S. Cl. 360—8 **5 Claims**



1. In a method of segmenting a continuous signal to permit the subsequent reconstruction of the continuous signal without introducing transients developed during processing of the segmented signals, the steps of:
   dividing a continuous signal into discrete segments, each of said segments being comprised of the plurality of signal samples, and
   repeating one or more of the last signal samples of a signal segment as the first signal samples of the next signal segment, the number of signal samples repeated corresponding to a time duration greater than the time duration of transients introduced during the processing of the segmented signals.

3,872,504
APPARATUS FOR REDUCING THE WOW AND FLUTTER OF A RECORDING MECHANISM

Donald K. Belcher, Springfield, Va., assignor to Signa-Signer, Inc., Fairfax, Va.

Filed Dec. 6, 1972, Ser. No. 312,656
Int. Cl. G11b *5/02, 5/43*
U.S. Cl. 360—27 **7 Claims**

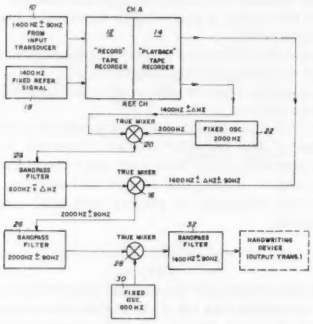
1. In a recording and reproducing system, a means for

compensation for the wow and flutter frequencies introduced by the recording and reproducing equipment comprising,

an output transducer,

a first means for producing a first signal including a first signal component, an information bearing input signal and said wow and flutter frequencies,

recording equipment for transcribing said information bearing signal on a first channel,



a playback means for producing a first output signal from said first channel corresponding to said first signal and the output of said playback means being connected to said first mixer means,

a second means for producing a second signal including a second signal component opposite in sense to said first signal component, and

a first mixer means combining said first and second signals so that said first and second signal components substantially cancel each other prior to reception of said information bearing input signal by said output transducer.

3,872,505

AUTOMATIC CARTRIDGE CHANGER

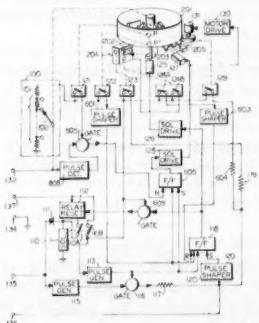
Tetsuo Hino; Eiji Minami; Isao Kozu, and Hidetoshi Kurihara, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 14, 1972, Ser. No. 262,470

Claims priority, application Japan, June 16, 1971, 46-43467; June 16, 1971, 46-43487

Int. Cl. G11b *5/00*

U.S. Cl. 360—92 **7 Claims**



1. An automatic cartridge changer comprising:

a rotary tray having a plurality of compartments for storing a plurality of cartridges, each of said compartments having a numerical code;

a tape player having a magnetic head and a tape moving means for the playback of said cartridges;

a tray driving means coupled to said rotary tray for rotating said rotary tray;

an index means engageable with said rotary tray for restricting rotation of said rotary tray so as to position a selected compartment at a first position;

a cartridge exchanging means for transporting a cartridge from said first position to a second position so as to engage said cartridge with said tape player and to play back said cartridge by said magnetic head;

a selecting means which operates in a step-wise manner to advance numerical codes when supplied with a voltage from an electric power source and stops its operation so as to select a numerical code when the voltage thereto from the electric power source is disconnected;

a switch connected between said selecting means and the power source for controlling the supply of electric power to said selecting means;

a first voltage coder coupled to said selecting means for producing a first voltage corresponding to the numerical code selected by said selecting means;

a second voltage coder coupled to said rotary tray for producing a second voltage corresponding to the numerical code of the selected compartment of said rotary tray when the selected compartment is positioned at said first position;

a voltage comparator for comparing the value of said first voltage of said first voltage coder with that of said second voltage of said second voltage coder;

a cartridge exchange detecting switch operatively coupled to said rotary tray for detecting the termination of the restoring of said cartridge by said cartridge exchanging means; and

a control means operatively coupled and receiving a first input signal relating to the termination of the restoring of said cartridge by said cartridge exchanging means for actuating said tray driving means, and also receiving a second input signal, relating to the termination of the rotation of said rotary tray to a selected position, for initiating said index means,

whereby said rotary tray can be automatically rotated for selecting a next cartridge to be played back in response to the temrination of the playback of said cartridge and, if necessary, a cartridge to be played back can be manually selected by manually operating said switch.

3,872,506

APPARATUS FOR AUTOMATICALLY PLAYING BACK INFORMATION IN CASSETTES

Marcel Jules Helene Staar, 479 Avenue Louise, Brussels, Belgium

Filed Sept. 7, 1971, Ser. No. 177,987

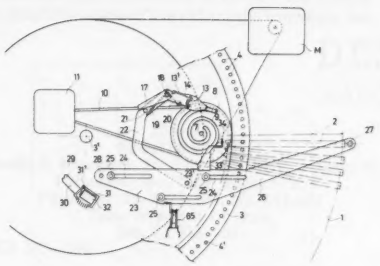
Claims priority, application Belgium, Sept. 7, 1970, 755810

Int. Cl. G11b *5/00*

U.S. Cl. 360—92 **8 Claims**

1. In an apparatus for automatically playing back adapted to automatically select recordings stored in cassettes comprising: a stationary circular magazine having a plurality of radially extending cassettes disposed therein; a turntable centrally located in said magazine, a playback device mounted on said turntable, said playback device and said magazine being in substantially coplanar relationship; means for rotating said turntable so as to sequentially convey the playback device into correspondence with a predetermined one of said cassettes; a selector device, said selector device comprising means for determining a selection and controlling the operation of the apparatus, counting and locating means, reading cells for determining the position of said counting and locating means, and a driving motor controlled by said selector device for

positioning the playback apparatus in sequential order opposite the cassettes disposed thereabout, said turntable having



marks thereon forming said counting and locating means of said selector device.

3,872,507

ROTATING AIR BEARING HEAD WITH SHAPED CONTROL SLOTS

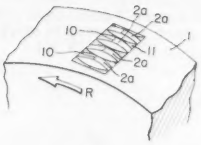
Kazuhiko Sano, and Shoji Omiya, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadomashi, Osaka, Japan

Filed Feb. 2, 1973, Ser. No. 328,957

Claims priority, application Japan, Feb. 4, 1972, 47-13073; Mar. 17, 1972, 47-27752; Mar. 17, 1972, 47-27753; Mar. 17, 1972, 47-27784; Apr. 14, 1972, 47-44890[U]; May 16, 1972, 47-57417[U]

Int. Cl. G11b *5/60, 5/22*

U.S. Cl. 360—102 **6 Claims**



1. A device of the type in which a plurality of magnetic heads are juxtaposed in spaced apart relation in the direction of the axis of rotation of a rotary drum on the outer peripheral surface thereof, and a magnetic tape is wrapped around said rotary drum and is spaced apart therefrom through a thin air layer so that signals may be recorded on and reproduced from said magnetic tape upon rotation of said rotary drum at high speed, the improvement wherein on both sides of each of said plurality of magnetic heads said outer peripheral surface of said rotary drum is provided with recesses along the length of said magnetic head, the bottom of said recesses being lower than said outer peripheral surface of said rotary drum and the leading edges of said recesses being lower than said outer peripheral surface of said rotary drum, and the bottom of said recesses becoming gradually shallower toward the trailing edges.

3,872,508

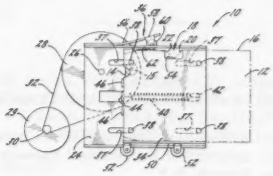
RETENTION ROLLER HOLDING MECHANISM FOR TAPE CARTRIDGE PLAYBACK APPARATUS

Theophiel Clement Jozef Lodewijk Staar, Kraainem, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed Jan. 24, 1973, Ser. No. 326,528

Int. Cl. G11b *5/00*

U.S. Cl. 360—137 **7 Claims**



1. A playback mechanism for a magnetic tape contained in a cartridge having the tape exposed in the forward end face thereof and having a V-shaped slot in a lateral face, said mechanism comprising

a housing for receiving the cartridge which is inserted inwardly forward end face first into an operative position, resilient retention means incldluing a roller and means resiliently on the housing to act generally perpendicularly to and toward said lateral face of the cartridge to enter the V shaped slot for holding the cartridge in its operative position, and

an element and means slidablly mounted said element on said housing and said element being engaged and moved by the cartridge from a first to a second position as the cartridge is inserted inwardly into its operative position, said element having a surface means substantially aligned with said lateral face of the cartridge at the forward end thereof which is engaged by said roller for holding said roller out of contact with the forward face of the cartridge and substantial engagement with a forward portion of the lateral face of the cartridge as the cartridge is inserted while allowing said roller to enter said V shaped slot when the cartridge approaches its operative position to resiliently hold the cartridge in its operative position.

3,872,509

CASSETTE TYPE MAGNETIC RECORDING AND REPRODUCING APPARATUS

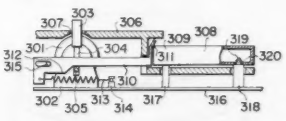
Tetsuji Yoshii, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 11, 1970, Ser. No. 71,592

Claims priority, application Japan, Sept. 19, 1969, 44-76031

Int. Cl. G11b *27/20*

U.S. Cl. 360—137 **1 Claim**



1. In a cassette type magnetic recording and reproducing machine comprising:

a. a cassette support;

b. means for indicating the amount of progress of the tape in a cassette; and

c. means, interposed between the cassette support and the indicating means, for automatically zero resetting the indicating means directly upon relative movement of the

cassette with respect to the playing position of the cassette tape in the machine, said means for automatically zero resetting including means for detecting insertion of the cassette into the machine and means for zero resetting when the cassette is removed from the playing position of the tape, said detecting means including means for ensuring that the cassette is correctly positioned in the playing position of the tape.

3,872,510

MAGNETIC TAPE CLEANING AND TENSIONING APPARATUS

Lloyd Krudop Childress, Jr., and John Allen Church, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1973, Ser. No. 364,768

Int. Cl. G11b *5/00, 15/43;* **B08b** *1/02*

U.S. Cl. 360—137 **2 Claims**

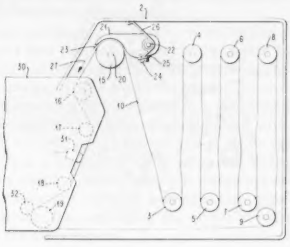
1. A magnetic tape handling apparatus comprising:

a magnetic tape loop;

a tape loop driver providing movement of said tape loop;

a roller positioned upstream from said driver over which a first surface of said tape loop passes, said roller freely rotating with movement of said tape loop over said roller; and

a magnetic tape cleaning and tensioning pad including a number of layers of relatively porous polyester fibers, said fibers being substantially randomly arranged, relatively highly dispersed and substantially continuous filaments bonded at a number of junctions of said filaments, said pad positioned adjacent to and biased toward said roller,

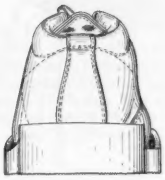


said pad engaging a second surface of said tape loop, whereby a first portion of said tape loop is pressed between said pad and said roller, said pad cleaning said second surface of said tape loop and said pad providing tension in a second portion of said tape loop between said roller and said driver substantially solely by friction between said second surface and said pad.

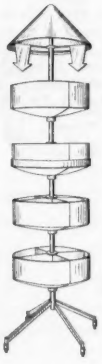
DESIGNS

MARCH 18, 1975

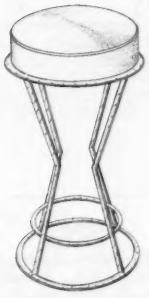
234,474
SPORTS BOOT
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Mar. 15, 1973, Ser. No. 341,681
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—276



234,475
SALE STAND
Karl Heinz Markus, Hamburg, Germany, assignor to Markus & Walsh, Norderstedt, Germany
Filed Feb. 14, 1973, Ser. No. 332,355
Claims priority, application Germany Sept. 5, 1972
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—24



234,476
STOOL
Irving M. Rosen, White Plains, N.Y., assignor to The Pace Collection Inc., New York, N.Y.
Filed Jan. 24, 1973, Ser. No. 326,391
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—35



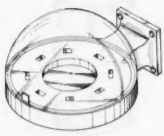
234,477
STOOL
William F. Lockhardt, Jr., Durham, Alfred M. Norton, Jr., Nashua, Dana P. Powers, Amherst, and Richard J. Norton, Nashua, N.H., assignors to The Maine Manufacturing Company, Nashua, N.H.
Filed Apr. 23, 1973, Ser. No. 353,798
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36

234,478
SIDE ARM CHAIR
Earl H. Koepke, Rte. 1, Scenic Drive, Sturgis, Mich. 49091
Filed Dec. 13, 1972, Ser. No. 314,605
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

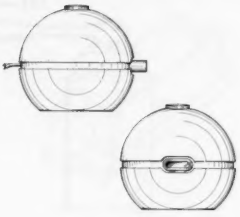
234,479
CHAIR
Raymond Eugene Grosfillex, Arbent, France, assignor to Grosfillex S.A.R.L., Arbent, France
Filed Feb. 28, 1973, Ser. No. 336,780
Claims priority, application France Sept. 5, 1972
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—74

234,480
CHAIR
Raymond Eugene Grosfillex, Arbent, France, assignor to Grosfillex S.A.R.L., Arbent, France
Filed Feb. 28, 1973, Ser. No. 336,782
Claims priority, application France Sept. 5, 1972
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—74

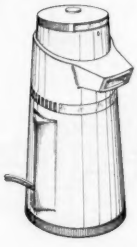
234,481
TOOTHBRUSH HOLDER
Lorraine McLeod, Houston, Tex. (2730 Lafferty, Apt. 235, Pasadena, Tex. 77503)
Filed Feb. 25, 1974, Ser. No. 445,082
Term of patent 14 years
Int. Cl. D4—*03*
U.S. Cl. D6—94



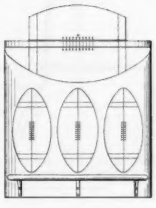
234,482
DISPENSER FOR HEATING A CREAM, A FOAM, AND THE LIKE
Martin Glaberson, Ardsley, N.Y., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed May 8, 1972, Ser. No. 251,554
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—95



234,483
DISPENSER FOR HEATING CREAMS, FOAMS, LOTIONS AND THE LIKE
George L. Schick, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed May 6, 1974, Ser. No. 467,329
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D6—95

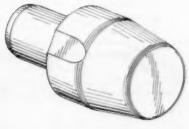


234,484
BAR OR THE LIKE
Cecilio I. Lazo de la Vega, P.O. Box 554, Valdosta, Ga. 31601
Filed July 12, 1972, Ser. No. 271,029
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144



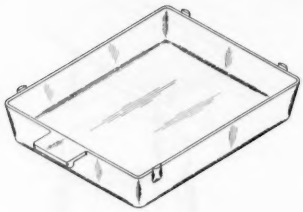
234,485
WORK BENCH
Ronald E. Isles, 623 S. Pine St., Brea, Calif. 92621
Filed May 14, 1973, Ser. No. 360,140
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—156

234,486
LOCKING LUG NUT
Arthur Duane Hale, Sr., 74 Eastfield, Rolling Hills, Calif. 90274
Filed Sept. 20, 1973, Ser. No. 398,965
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—273

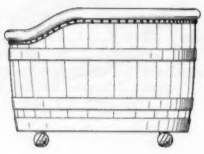


234,487
COFFEEMAKER
Franz Alban Stuetzer, Muhlheim am Main, and Klaus Mayer, Offenbach am Main, Germany, assignors to Rowenta-Werke, G.m.b.H.
Filed Aug. 13, 1973, Ser. No. 388,503
Claims priority, application Germany Feb. 16, 1973
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—62

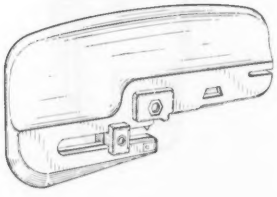
234,488
COOKING UTENSIL
Hubert J. Wiebe, 1926 Mentor 67213, and Max V. Gearheart, 1320 Summitlawn Court 67212, both of Wichita, Kans.
Filed Aug. 20, 1973, Ser. No. 390,070
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—95



234,489
CONTAINER FOR FIREWOOD AND THE LIKE
James M. Shaw, Rte. 1, Box 213, Catoosa, Okla. 74015
Filed July 20, 1973, Ser. No. 381,158
Term of patent 14 years
Int. Cl. D7—*08;* D6—*01;* D11—*02*
U.S. Cl. D7—212



234,490
LAMINATE TRIMMER
Peter Barlow, Napier St., Sheffield S11 8HB, England
Filed July 6, 1973, Ser. No. 377,082
Claims priority, application Great Britain Mar. 21, 1973
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

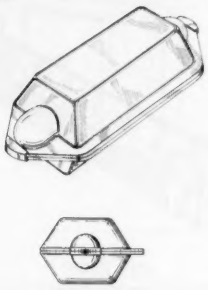


234,491
AEROSOL CONTAINER
Carol Schafer, 4022 Ingraham St., Los Angeles, Calif. 90017
Filed Dec. 22, 1969, Ser. No. 20,585
Term of patent 14 years
The term of this patent subsequent to May 18, 1986, has been disclaimed
Int. Cl. D9—*01*
U.S. Cl. D9—9

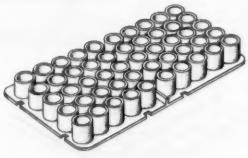
234,492
BOTTLE OR THE LIKE
Ronald A. Peterson, Scarsdale, N.Y., assignor to Richardson-Merrell Inc., New York, N.Y.
Filed May 3), 1973, Ser. No. 365,186
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—116

234,493
BOTTLE
Peter L. Schweizer, Liberty Center, Ohio, assignor to Owens Illinois, Inc., Toledo, Ohio
Filed Mar. 16, 1973, Ser. No. 342,164
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—137

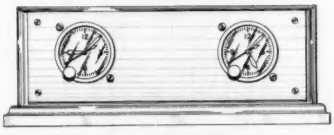
234,494
PACKAGING CONTAINER FOR FOOD OR THE LIKE
Ernst Theodore Theimer, Rumson, and Donald Joseph Roslonski, Bricktown, N.J., assignors to National Electro-Cook Corporation, Brunswick, N.J.
Filed Jan. 4, 1973, Ser. No. 320,876
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—182



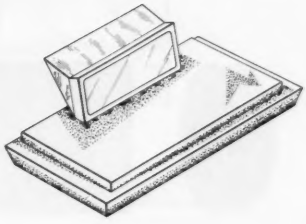
234,495
AMMUNITION TRAY
William J. Minneman, Clayton, Ohio, assignor to MTM Molded Products Company, Dayton, Ohio
Filed June 18, 1973, Ser. No. 371,132
Term of patent 14 years
Int. Cl. D22—*99*
U.S. Cl. D9—187



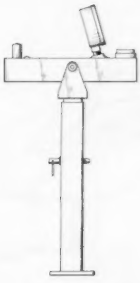
234,496
TIME COMPARISON CLOCK
Ephriam (John) Johnson, 1 Newbury St., Auburn, Maine 04210
Filed June 15, 1972, Ser. No. 263,383
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—14



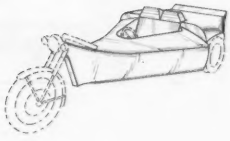
234,497
DIGITAL DESK CLOCK
James S. Carlyle, Santa Clara, Calif., assignor to American Micro-Systems, Incorporated, Santa Clara, Calif.
Filed Oct. 10, 1972, Ser. No. 295,925
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



234,498
HYDRAULIC WEIGHING SCALE
Richard C. Etchison, Rte. 6, Box 342, Anderson, Ind. 46011
Filed Apr. 16, 1973, Ser. No. 351,346
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—87

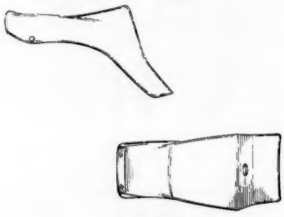


234,499
VEHICLE BODY
Henry Altepeter, 1014 S. 10th Ave., St. Charles, Ill. 60134
Filed Nov. 8, 1973, Ser. No. 414,176
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—85



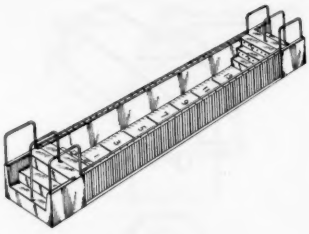
234,500
TIRE
Masafumi Kawakami and Shigehiro Hashegawa, Kobe, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Jan. 29, 1973, Ser. No. 327,547
Claims priority, application Japan Oct. 28, 1972
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143

234,501
MOTORCYCLE FENDER
Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry, Inc., Somersville, Conn.
Filed Sept. 13, 1973, Ser. No. 397,131
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—186

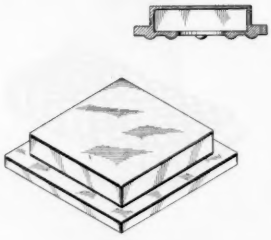


234,502
MOTORCYCLE FENDER
Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry, Inc., Somersville, Conn.
Filed Sept. 13, 1973, Ser. No. 397,132
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—186

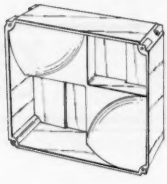
234,503
POOL FOR ELEMENTARY SWIMMING CLASSES
Claude W. Ahrens, West Highway 6, Grinnell, Iowa 50112
Filed Apr. 6, 1973, Ser. No. 348,510
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 G



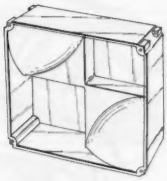
234,504
HOLLOW CERAMIC THREE DIMENSIONAL WALL TILE
William M. Groff, 1045 Halifax Road, Jacksonville, Fla. 32216
Filed Aug. 17, 1972, Ser. No. 281,470
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 B



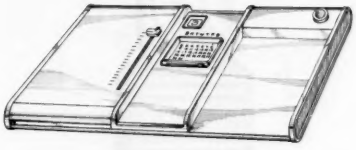
234,505
BUILDING BLOCK OR THE LIKE
Roland Spellier, Waterfohr 3, Lemgo, Germany
Filed Mar. 7, 1973, Ser. No. 338,787
Claims priority, application Germany Sept. 7, 1972
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 R



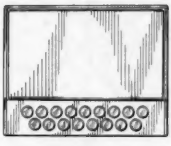
234,506
BUILDING BLOCK OR THE LIKE
Roland Spellier, Waterfohr 3, Lemgo, Germany
Filed Mar. 7, 1973, Ser. No. 338,788
Claims priority, application Germany Sept. 7, 1972
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 R



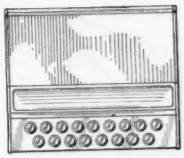
234,507
DESK SET
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company Ltd., Tokyo, Japan
Filed June 4, 1973, Ser. No. 366,619
Claims priority, application Japan Mar. 6, 1973
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75



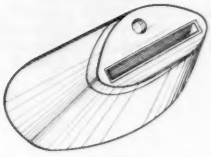
234,508
PUSH BUTTON TELEPHONE LIST FINDER
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company Ltd., Tokyo, Japan
Filed June 4, 1973, Ser. No. 366,620
Claims priority, application Japan Mar. 8, 1973
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



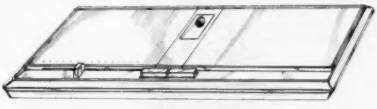
234,509
PUSH BUTTON TELEPHONE LIST FINDER
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company Ltd., Tokyo, Japan
Filed June 4, 1973, Ser. No. 366,692
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



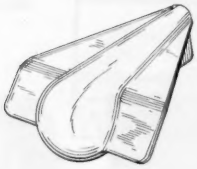
234,510
COMBINED MEMO HOLDER AND PEN STAND
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company Ltd., Tokyo, Japan
Filed June 4, 1973, Ser. No. 366,694
Claims priority, application Japan Mar. 17, 1973
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—78



234,511
DESK SET
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company Ltd., Tokyo, Japan
Filed June 4, 1973, Ser. No. 366,751
Claims priority, application Japan Mar. 1, 1973
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—78

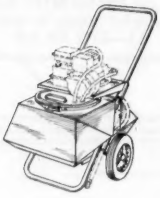


234,512
TROLLING SINKER
William E. Evans, 524 N. 28th St., Milwaukee, Wis. 53208
Filed Mar. 26, 1974, Ser. No. 454,884
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—30

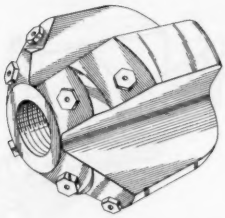


234,513
UTILITY SPRAYER
William J. Kommers, Sioux City, Iowa, assignor to The Broyhill Co., Dakota City, Nebr.
Filed July 5, 1973, Ser. No. 376,411
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

234,514
UTILITY SPRAYER
William J. Kommers, Sioux City, Iowa, and Clarence E. Stewart, South Sioux City, Nebr., assignors to The Broyhill Co., Dakota City, Nebr.
Filed July 25, 1973, Ser. No. 382,443
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

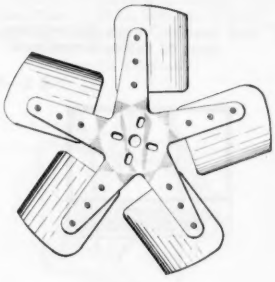


234,515
NOZZLE
Philip C. Masters, Ashland, Ohio, assignor to McNeal Corporation, Akron, Ohio
Filed Mar. 1, 1973, Ser. No. 337,065
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34

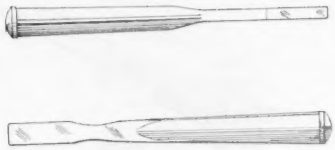


234,516
DOWN SPOUT ADAPTER
Marty E. Sixt, Iowa City, Iowa, assignor to Advance Drainage Systems, Inc., Columbus, Ohio
Filed Mar. 29, 1973, Ser. No. 345,876
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—45

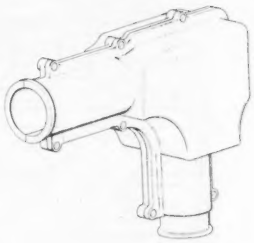
234,517
FAN
Bern M. Bonifant, Tacoma, Wash., assignor to Flex-A-Lite Corporation, Tacoma, Wash.
Filed Sept. 7, 1973, Ser. No. 395,278
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165



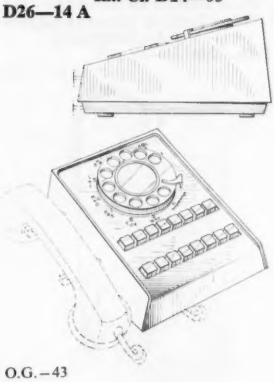
234,518
COMBINATION TOOTH BRUSH HANDLE AND DENTAL FLOSS DISPENSER
Irvin V. Gerlich, West Des Moines, Iowa, assignor to Den-Tal-Ez Mfg. Co., Des Moines, Iowa
Filed Nov. 16, 1972, Ser. No. 307,139
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—1 D



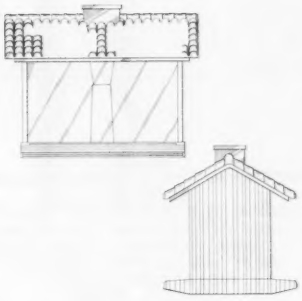
234,519
SPLICE ENCLOSURE OR THE LIKE
Edward F. Rynk, Linden, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Nov. 29, 1973, Ser. No. 420,007
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 C



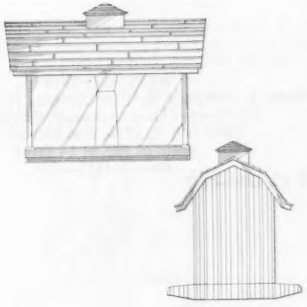
234,520
BASE FOR A TELEPHONE SET
Paul Marchese, Greenwich, Conn., assignor to TIE/communications, Inc., Stamford, Conn.
Filed Apr. 4, 1974, Ser. No. 458,016
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



234,521
BIRD FEEDER
James C. Fry, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 18, 1973, Ser. No. 361,774
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

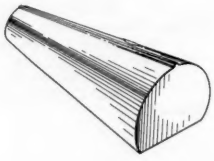


234,522
BIRD FEEDER
James C. Fry, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 18, 1973, Ser. No. 361,798
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

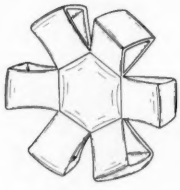


234,523
HAND PUPPET
Tomoji Ohnuki, 18–4 Suwada 2-chome, Ichikawa, Japan
Filed May 12, 1972, Ser. No. 252,962
Claims priority, application Japan Jan. 28, 1972
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

234,524
GOLF PUTTER HEAD
Eugene R. Leander, Rockford, Ill., assignor to Pro Enterprises, Ltd., Rockford, Ill.
Filed Jan. 8, 1973, Ser. No. 321,955
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

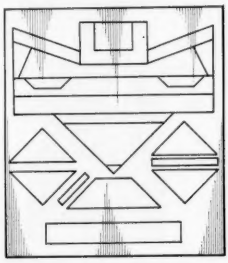


234,525
STUFFED TOY
William J. Maloney II, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed July 9, 1973, Ser. No. 377,523
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



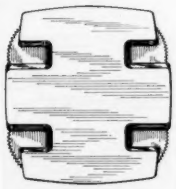
234,526
PORTABLE GOLF GAME TARGET
Walter Zawacki, 3927 Porpoise Drive SE., St. Petersburg, Fla. 33705
Filed May 24, 1972, Ser. No. 256,634
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 NN

234,527
DART GAME BOARD
James W. Sowerbrower, Alexandria, Va. (3713 Nile Road, Davidsonville, Md. 21035)
Filed Mar. 7, 1973, Ser. No. 338,937
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

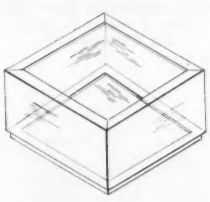


234,528
HAND PUPPET
Tomoji Ohnuki, 18–4 Suwada 2-chome, Ichikawa, Japan
Filed July 17, 1972, Ser. No. 272,187
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

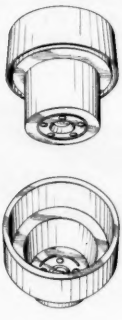
234,529
WRIST MOUNTED TENNIS SCORE RECORDER
William R. Trager, Mission Hills, Kans., assignor to Ade Tennis, Inc., Kansas City, Mo.
Filed Feb. 20, 1973, Ser. No. 333,755
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—5 MM



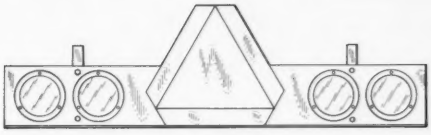
234,530
PLANTER
Simon V. Waitzman, Brooklyn, N.Y., assignor to Colonial Mirror and Glass Corporation
Filed May 9, 1973, Ser. No. 358,716
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



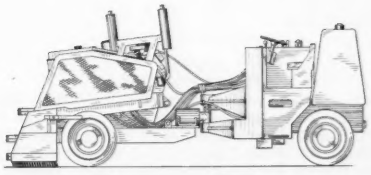
234,531
FLOWER POT
Rodney Dennis Bufton, Chapelfields, England, assignor to The Lucas Electrical Company Limited, Birmingham, England
Filed June 21, 1973, Ser. No. 372,101
Claims priority, application Great Britain Dec. 21, 1972
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



234,532
SLOW MOVING EQUIPMENT SAFETY LIGHT
Elmer P. Reicherts, R.R. 1, Clear Lake, Iowa 50428
Filed June 22, 1973, Ser. No. 372,790
Term of patent 14 years
Int. Cl. D26—*06*; D29—*02*
U.S. Cl. D48—32 R

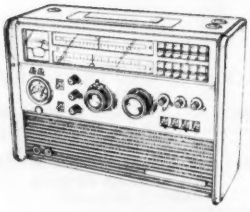


234,533
SURFACE CLEANING AND SCARIFYING MACHINE
Paul W. Kimzey, St. Louis Park, Keith N. Krier, Minneapolis, and John N. Polivka, Hopkins, Minn., assignors to Tennant Company, Minneapolis, Minn.
Filed Aug. 2, 1973, Ser. No. 385,086
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D49—9.1

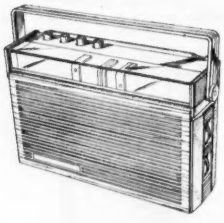


234,534
THERMOMETER
Gilbert Davidson, Newton, Mass., assignor to American Science & Engineering, Inc., Cambridge, Mass.
Filed July 10, 1969, Ser. No. 18,167
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—58

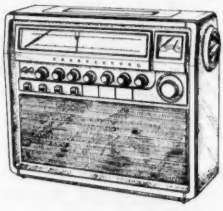
234,535
RADIO RECEIVER
Masaaki Miyamoto and Kazumasa Takenaka, Moriguchi-shi, Osaka, Ken Kawamura, Katano-shi, Osaka, and Hironosuke Koda, Kyoto, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 15, 1973, Ser. No. 388,668
Claims priority, application Japan Feb. 20, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



234,536
PORTABLE RADIO
Shuhei Taguchi, Moriguchi-shi, Osaka, and Benito Mishiro, Sakai-shi, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 16, 1973, Ser. No. 389,073
Claims priority, application Japan Feb. 16, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

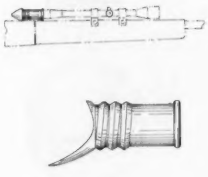


234,537
RADIO RECEIVER
Takeyoshi Kawano, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 22, 1973, Ser. No. 390,635
Claims priority, application Japan Apr. 11, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

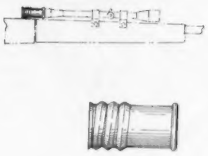


234,538
PORTABLE RADIO
Takeyoshi Kawano, Kyoto, and Hiroshi Hirasa, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 22, 1973, Ser. No. 390,636
Claims priority, application Japan Apr. 11, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

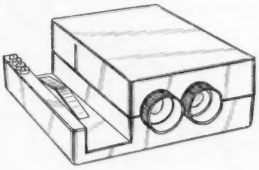
234,539
TELESCOPIC SIGHT EYE PROTECTOR
Frank Jack Marchetti, 16 W 101 Timber Trails Drive, Elmhurst, Ill. 60126
Filed Sept. 4, 1973, Ser. No. 393,946
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



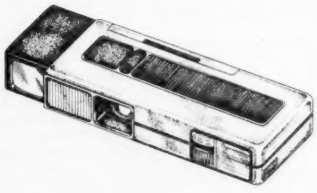
234,540
TELESCOPIC SIGHT EYE PROTECTOR
Frank Jack Marchetti, 16 W 101 Timber Trails Drive, Elmhurst, Ill. 60126
Filed Sept. 6, 1973, Ser. No. 394,777
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



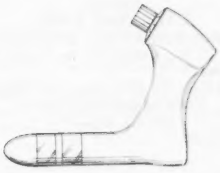
234,541
SLIDE PROJECTOR
Reinhard Sobotta, Mascherode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Filed June 6, 1973, Ser. No. 367,470
Claims priority, application Germany Dec. 11, 1972
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 J



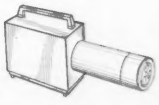
234,542
PHOTOGRAPHIC CAMERA
Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 4, 1973, Ser. No. 403,438
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 B



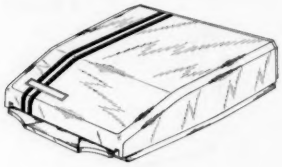
234,543
MUSCLE TONE STIMULATION DEVICE
Milton E. Foster, Palos Verdes Peninsula, Calif., assignor to Techni Med Inc., Torrance, Calif.
Filed Nov. 24, 1972, Ser. No. 309,252
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D83—1 T



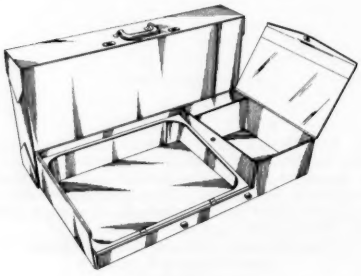
234,544
X-RAY APPARATUS
Vitislav Yakovlevich Bobov, Bolsheokhtinsky prospekt 12, kv. 42; Ernest Mikhailovich Belopolsky, Naberezhnaya Lazareva 20, kv. 32; Genrikh Leivovich Troyansky, prospekt Energetikov, 54 korpus 1, kv. 160, and Avrum Lvovich Farberg, ulitsa B. Ozernaya 86, kv. 1, all of Leningrad, U.S.S.R.
Filed Mar. 26, 1973, Ser. No. 345,196
Term of patent 7 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 H



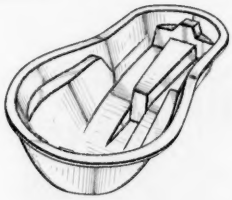
234,545
TYPEWRITER CARRYING CASE
Alejandro De Tomaso, % Ghia S.p.A., Via A. Da Montefeltro 5, and Thom Tjaarda, Str. Ponteverde 12, both of Turin, Italy
Filed Oct. 25, 1972, Ser. No. 300,549
(Filed under Rule 47(b) and 35 U.S.C. 118)
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



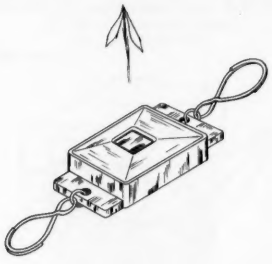
234,546
CARRYING CASE
Jefferson Freeman, Pound Ridge, and Stephen L. Doppelt, Orangeburg, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Feb. 28, 1973, Ser. No. 336,649
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R



234,547
HYDROTHERAPY BATH TUB
Michel Nicollet, 6 Oberlin St., 6700 Strasbourg, France
Filed Aug. 21, 1973, Ser. No. 389,627
Claims priority, application France Feb. 22, 1973
Term of patent 14 years
Int. Cl. D24—*01*; D23—*02*
U.S. Cl. D83—1 C



234,548
KEY HOLDER
Alwin J. Stahel, New Brighton, Minn., assignor to Teraco, Inc., Midland, Tex.
Filed May 21, 1973, Ser. No. 362,188
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—8



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF MARCH, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ehrenreich & Cie.: *See—*
Muhr, Heinrich; Sprenger, Wolfgang; Schnitzler, Franz-Dieter; Degenkolbe, Adolf; Willemsen, Hans; Bruss, Horst; Blumberg, Willy; and Belsdorf, Manfred, 3,871,192.

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Miller, Kenneth J., 3,871,267.

A/SE Ramussen: *See—*
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Berglund, Jan, 3,871,131.

AB Volvo Penta: *See—*
Perldal, Karl Lennart, 3,871,199.

Abbott, Donald W., to Windtie Corporation. Device for holding down mobile homes. 3,871,142, Cl. 52-23.000.

Abdou, Mohamed; and Buchta, Karl, to Boehringer Ingelheim G.m.b.H. Synthetic nutrient medium for microorganisms and method of use. 3,871,967, Cl. 195-100.000.

Abe, Nobuyoshi: *See—*
Kubo, Shigenaga; and Abe, Nobuyoshi, 3,871,894.

Abe, Takashi: *See—*
Nagase, Shunji; Baba, Hajime; Kodaira, Kazuo; Abe, Takashi; and Yonekura, Michimasa, 3,871,975.

Abe, Toshiyuki: *See—*
Matsushima, Yoshiichi; and Abe, Toshiyuki, 3,872,347.

Abel, Gunther. Apparatus for taking floating and solid materials out of channels. 3,872,006, Cl. 210-158.000.

Abernathy, William D. Wall frame construction method. 3,871,061, Cl. 29-431.000.

Abu Aktiebolag: *See—*
Murvall, Ake Eugen, 3,871,785.

Accatino, Augusto, to Stat S.n.c. di Accatino & C. Sun visor of plastics for motor vehicles and manufacturing method. 3,871,703, Cl. 296-97.00H.

ACF Industries, Incorporated: *See—*
Brown, Morris C.; Cook, Forrest W.; Kalert, Ralph E.; Vollmer, Arthur C.; and Winkley, Jerry H., 3,872,188.
Brown, Morris C.; Cook, Forrest W.; Kalert, Ralph E.; Vollmer, Arthur C.; and Winkley, Jerry H., 3,872,189.
Brown, Morris C.; Cook, Forrest W.; Kalert, Ralph E.; Vollmer, Arthur C.; and Winkley, Jerry H., 3,872,190.

Ackley, Edward M., to R. W. Hartnett Company. Capsule orienting apparatus and method of spin printing. 3,871,295, Cl. 101-426.000.

Acquaviva, Thomas: *See—*
Kukucka, William P.; and Acquaviva, Thomas, 3,871,643.

Adachi, Motoharu; Nishizawa, Shunichi; Ishida, Michiyasu; Kaneko, Takashi; and Yonenaga, Tasushi, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for traversing a workpiece with a working head. 3,871,062, Cl. 29-470.000.

Adams, James E.: *See—*
Haas, Werner E. L.; Adams, James E.; and Mechlowitz, Bela, 3,871,904.

Adams, Melvin Edward; and Feryszka, Rubin, to RCA Corporation. R-F switching circuit. 3,872,325, Cl. 307-251.000.

Adams, Phillip: *See—*
Merianos, John J.; and Adams, Phillip, 3,871,861.
Merianos, John J.; and Adams, Phillip, 3,871,862.

Adams, William Kiger; and Anderson, James Alan, to Stauffer Chemical Company. Aqueous based release composition. 3,872,038, Cl. 260-13.000.

Addressograph-Multigraph Corporation: *See—*
Mabrouk, Saied Abd-Elrahman, 3,871,761.

Adler, Robert; and Knitter, Roger W., to Zenith Radio Corporation. Video disc pickup with capacitive tracking. 3,872,241, Cl. 178-6.60A.

Adler, Stanford L., to Technicon Instruments Corporation. Method for preparing smears of biological liquids. 3,871,895, Cl. 117-3.000.

Adomaitis, Domas, to Continental Can Company, Inc. Bottom structure for plastic containers. 3,871,541, Cl. 215-1.00C.

Adwest Engineering Limited: *See—*
Millard, Barry J.; and Jenvey, Leslie R., 3,871,469.

Aerojet General Corporation: *See—*
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Afshar, Gossem Hekmat. Turbine clocks. 3,871,167, Cl. 58-14.000.

Ageev, Leonid Matveevich: *See—*
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Agence Nationale de Valorisation de la Recherche (Anvar): *See—*
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Smolderen, Albert Emiel, 3,871,595.

Agfa-Gevaert, N.V.: *See—*
De Belder, Maurice Hector; Bollen, Romain Henri; and Van Esch, Robert Florent, 3,872,309.

Ahlstone, Arthur G., to Vetco Offshore Industries, Inc. Casing hanger and packoff apparatus. 3,871,449, Cl. 166-183.000.

Aikawa, Hiroshi: *See—*
Ito, Naganori; and Aikawa, Hiroshi, 3,871,680.

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Saito, Hideomi; Yamashita, Takashi; Munezawa, Takuro; and Kato, Tetsuya, 3,872,142.
Tobe, Sadanobu; Hirose, Yoshiteru; Nakamura, Yoshihiro; and Mitsugi, Koji, 3,871,963.
Yasuda, Naohiko; Ariyoshi, Yasuo; and Toi, Koji, 3,872,099.

Akiyama, Kazuhiro, to Fuji Photo Optical Co., Ltd. Measuring system switching means for single lens reflex camera. 3,872,482, Cl. 354-46.000.

Aktieselskabet De Danske Sukkerfabrikker: *See—*
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Aktieselskabet For Kantor Kemi: *See—*
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Akzona Incorporated: *See—*
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Al-Dabbagh, Adam M.; and Dudzik, Leonard J., to Unarco Industries, Inc. Safety connector for knock-down racks. 3,871,525, Cl. 211-176.000.

Albany International Corporation: *See—*
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Albert Klein KG: *See—*
Bastgen, Wendel, 3,871,285.

Albright & Wilson Limited: *See—*
Ely, Christopher Scott, 3,872,059.

Aldrich, William E., to Warnaco, Inc. Hosiery finishing process for treating fabrics containing spandex yarn. 3,871,909, Cl. 117-138.80N.

Alexander, Albert H. D., to Oil Base, Inc. Water loss additive for sea water mud comprising an alkaline earth oxide or hydroxide, starch and polyvinyl alcohol. 3,872,018, Cl. 252-8.50A.

Alexander, George F.: *See—*
Krolak, Ronald L.; Gianessi, Albert; and Alexander, George F., 3,871,462.

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Wells, Ronald K.; and Allen, Charles W., 3,871,261.

Allen, Connie A.: *See—*
Motter, James W.; and Allen, Connie A., 3,872,231.

Allen, John W., to Stanray Corporation. Connection diaphragms between articulated cars. 3,871,276, Cl. 105-8.00R.

Allen, John W. Box car end and liner. 3,871,279, Cl. 105-410.000.

Allied Chemical Corporation: *See—*
Polk, Donald E.; and Morris, Robert C., 3,871,836.
Schevey, William R.; and Kremers, Frank J., 3,871,929.

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Aluminum Company of America: *See—*
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AMC Corporation: *See—*
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American Air Filter Company, Inc.: *See—*
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American Chain & Cable Company, Inc.: *See—*
Wentz, Edward A.; and Shinnick, David M., 3,871,511.
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American Hospital Supply Corporation: *See—*
Mueller, Floyd F.; Aulik, Clarence J.; and Zeman, Paul R., 3,871,637.
American Optical Corporation: *See—*
Day, Christopher C., 3,871,363.
Amery, John Gordon; and Jorgenson, Robert Warren, to RCA Corporation. Signal translating apparatus for composite signal subject to jitter. 3,872,497, Cl. 358-4.000.
Ametek, Inc.: *See—*
Thompson, Bruce, 3,871,667.
Ammco Tools, Inc.: *See—*
Mitchell, Wallace F., 3,871,066.
AMP Incorporated: *See—*
Carter, Clyde Thomas, 3,871,736.
Dechelette, Helen, 3,871,738.
Folk, Kenneth Foster, 3,871,072.
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Langenberg, Earl G., 3,871,932.
Analog Devices, Incorporated: *See—*
Wold, Ivar, 3,872,466.
Ancker, Fred H., to Union Carbide Corporation. Apparatus for producing substantially uniform calendered material. 3,871,808, Cl. 425-367.000.
Andersen Corporation: *See—*
Peterson, Kenneth L., 3,871,428.
Andersen, John V., to Aktieselskabet For Kantor Kemi. Duplicator stencil. 3,871,899, Cl. 117-35.500.
Andersen, Kjeld Jorn; Fischer, Finn; Rostrup-Nielsen, Jens; and Wrisberg, Johannes, to Haldor Topsoe A/S; and Fluor Corporation. Process for catalytic steam cracking. 3,872,179, Cl. 260-683.00R.
Andersen, Leonard Morgansen. Device for salvaging metal objects and salvaging method. 3,871,315, Cl. 114-51.000.
Anderson, Edward William, to Smiths Industries Limited. Distance or speed measuring apparatus for land-vehicles. 3,871,235, Cl. 73-510.000.
Anderson Electric Corporation: *See—*
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Anderson, Gordon H., to King-Seely Thermos Co. Discharge chute for vibratory finishing machine. 3,871,135, Cl. 51-163.000.
Anderson, James Alan: *See—*
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Anderson, Leslie T., to EMCO Limited. Water spout. 3,871,406, Cl. 137-801.000.
Anderson, Norman Richard: *See—*
Dorrell, Robert Francis; and Anderson, Norman Richard, 3,871,737.
Andral, Guillaume; Carmassi, Michel; Louvel, Bernard; Maurice, Jacques; and Vandesande, Georges, to Societe Anonyme dite: Aquitaine Total Organico. Process for automated regulation of sulphur production units. 3,871,831, Cl. 23-255.00R.
Andrews, Ronald A., to United States of America, Navy. Optical waveguide display panel. 3,871,747, Cl. 350-160.00R.
Anemaet, John M., to Dennison Manufacturing Co. Development electrode. 3,871,329, Cl. 118-637.000.
Anesi, Mario; Macri, Salvatore; and Wynn, John P., to Ansan Tool and Manufacturing Co., Inc. Coin chute with improved calipering and latching mechanism. 3,871,504, Cl. 194-55.000.
Angers, John W.: *See—*
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Anschutz, Erhard; and Gotz, Walter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Cutting tool. 3,871,092, Cl. 29-95.00R.
Antonioni, Rinaldo, to Hatala, Andrew A., a part interest. Tape dispenser. 3,871,940, Cl. 156-353.000.
Antonius, Vinnemann: *See—*
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Anzai, Takanori: *See—*
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APM Corporation: *See—*
Cotter, Mitchell A., 3,872,264.
Appleton, Arthur I. Light socket with auxiliary contact. 3,871,732, Cl. 339-91.00L.
Arai, Akihiro: *See—*
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Arai, Akio, to Kabushiki Kaisha Ricoh. Method of forming colored copied image. 3,871,879, Cl. 96-1.200.
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Arbter, Conrad. Upright folding apparatus for clothing articles. 3,871,561, Cl. 223-37.000.
Archifar Industrie Chimiche del Trentino S.p.A.: *See—*
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Ariyoshi, Yasuo; Yamatani, Tetsuo; Uchiyama, Noboru; Sato, Naotake; and Toi, Koji, to Ajinomoto Co., Inc. Method of preparing hydrohalides of aspartic anhydride. 3,872,110, Cl. 260-346.80R.
Ariyoshi, Yasuo: *See—*
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Arizona Chemical Company: *See—*
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Arney, Thomas J. Oil level indicating device for a crankcase or transmission. 3,872,429, Cl. 340-59.000.
Arts, Marcus: *See—*
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Arx, Georg Von: *See—*
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Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
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Asai, Shin-ichiro: *See—*
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Asano, Yoshio, to Fuji Photo Film Co., Ltd. Auto-process camera having selectively insertable self developing film sheets. 3,872,485, Cl. 354-83.000.
Asgar, Kamal; and Reichman, Steven H. Dental Amalgam. 3,871,876, Cl. 75-169.000.
Aspro, Incorporated: *See—*
Jeffers, Ellis E., 3,871,249.
Astley, Edward T., to Crosfield Electronics Limited. Spot positioning control for display tubes. 3,872,348, Cl. 315-10.000.
Astra Plastique: *See—*
Bereziat, Andre, 3,871,545.
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Castonguay, Leon H., 3,871,473.
Attema, Gijsbertus, to Researchcentrum Ogemat N.V. System for the installation of electric wiring in a building. 3,871,729, Cl. 339-21.00R.
Attenburrow, David J., to Reed International Limited. Invalid transfer device. 3,871,036, Cl. 5-81.00R.
Atwood, Gilbert R.; Blake, Robert J.; Butwell, Kenneth F.; and Dunnery, David A., to Union Carbide Corporation. Separation of potassium ions from sodium ions using alkanolamines. 3,872,212, Cl. 423-184.000.
Auerbach, Albert A.; Katz, George M.; and Steinberg, Sidney, to Medalert Corporation. Electrocardiography transmitter and transmission method. 3,872,251, Cl. 179-2.00A.
Aulik, Clarence J.: *See—*
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Kinney, James F.; and Gadzala, Antoni Edward, 3,871,818.

Axelrod, Herbert R. Pet toy. 3,871,334, Cl. 119-29.500.

Azarowics, Edward N., to Bioteknika International Inc. Microbial degradation of petroleum. 3,871,956, Cl. 195-2.000.

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Bachmann, Horst; and Kossler, Hans Joachim, to Langenstein & Schemann Aktiengesellschaft. Screw forging press. 3,871,225, Cl. 72-452.000.

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Badische Anilin- & Fabrik Aktiengesellschaft: *See*—
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Bakay, Bohdan. Method and apparatus for transporting discretely samples to be analyzed in a gel. 3,871,826, Cl. 23-230.00R.

Baker, Jeffrey A., to FMC Corporation. Skimming apparatus for clarification tanks. 3,872,005, Cl. 210-141.000.

Baker Oil Tools, Inc.: *See*—
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Bakerdrill, Inc.: *See*—
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Ballek, William. Knockdown ladder with removable rungs. 3,871,481, Cl. 182-151.000.

Balsam, Philip J., to Beattie Development Company. Optical mold forming means. 3,871,610, Cl. 249-102.000.

Banach, Frank G., to Zenith Radio Corporation. Frequency response modifier for fixed-tuned IF amplifiers. 3,872,387, Cl. 325-427.000.

Bando, Yasuo: *See*—
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Bardy, Andrew. Walking-rollerskate device. 3,871,672, Cl. 280-11.210.

Barish, Thomas. Two-power-path bevel gearing for high loads and high speeds. 3,871,248, Cl. 74-665.00P.

Barker, Allan: *See*—
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Barrett, James H., Jr. Battery plate forming apparatus. 3,871,919, Cl. 136-82.000.

Barry, Martin J.; and Nobles, Elon J., to Edward J. Cabic, a part interest. Apparatus for applying heating and cooling media to mold plate. 3,871,811, Cl. 425-407.000.

Barsby, Alan, to Marshall-Fowler Limited. Vibrating roller. 3,871,788, Cl. 404-117.000.

Bartenstein, Peter, to Siemens Aktiengesellschaft. Pilot regulated carrier frequency line amplifier. 3,872,394, Cl. 330-52.000.

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Bartl, Herbert: *See*—
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Bartlett, Sidney Charles Leddra. Swimming pool covers. 3,871,033, Cl. 4-172.130.

Barton, Derek Harold Richard; Underwood, William George Elphinstone; Looker, Brian Edgar; Hewitt, Graham; and Taylor, Michael Victor, to Glaxo Laboratories Limited. Certain disulfide derivatives of 2-azetidinones. 3,872,086, Cl. 260-239.00A.

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Bastgen, Wendel, to Albert Klein KG. Incinerator device and a method of processing residuals in waste water, liquefied sewage and sludge. 3,871,285, Cl. 110-8.00R.

Bastide, Paul; and Bonneton, Robert, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Oscillator control circuit. 3,872,396, Cl. 331-1.00A.

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Baut, Jacques; and Journee, Paul. Auto windscreen-wiper blades. 3,871,050, Cl. 15-250.320.

Baxter, Vernon A., Jr., to Magnetic Controls Company. Telephone monitor circuit. 3,872,266, Cl. 179-175.20C.

Bayard, Jean Claude; Fournet, Louis; Jacob, Jean; Pierre, Bernard; and Roux, Marcel, to Etat Francais. Percussion fuses with a tilting rotor for gyratory projectiles. 3,871,297, Cl. 102-79.000.

Bayer Aktiengesellschaft: *See*—
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Beatrice Foods Company: *See*—
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Beattie Development Company: *See*—
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Beattie, John O., 3,871,803.

Beattie, John O., to Beattie Development Company. Apparatus for producing an optical molding plaque. 3,871,803, Cl. 425-175.000.

Beatty, Theodore R.; and Vourlis, Harry, to Union Carbide Corporation. Flat alkaline cell construction and method for assembling the same. 3,871,921, Cl. 136-111.000.

Beaudout, Henri. Directional device. 3,871,108, Cl. 33-349.000.

Becattini, Angiolo; and Sassi, Pietro Angelo. Arrangement in a drafting machine for precise measurement of angles. 3,871,101, Cl. 33-79.00R.

Bechtloff, Gert, to Friedrick Kocks GmbH. Load take-up apparatus for lifting devices. 3,871,697, Cl. 294-81.0SF.

Beckman Instruments, Inc.: *See*—
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Bedague, Pierre; Marchand, Pierre; Parc, Guy; and Roux, Fernand, to Institut Francais du Petrole, des Carburants et Carburants. Method for lubricating 2-stroke engines and rotary engines. 3,871,837, Cl. 44-58.000.

Behrend, Volkmar, to Orenstein & Koppel AG. Fluid motor drive for lifting device such as a winch with accumulated pressure starting after brake release. 3,871,714, Cl. 303-10.000.

Behrendt, Siegfried: *See—*
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Belcher, Donald K., to Signa-Signer, Inc. Apparatus for reducing the wow and flutter of a recording mechanism. 3,872,504, Cl. 360-27.000.

Belcher, Ronald; Townshend, Alan; and Bogdanski, Stanley. Molecular emission cavity analysis. 3,871,768, Cl. 356-87.000.

Bell, George Richard, to Johns-Manville Corporation. Filter aid materials dispersible in organic liquids. 3,872,016, Cl. 210-500.000.

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Bellina, Russell F., to du Pont de Nemours, E. I., and Company. Amino-oxime acetamide-0-carbamates as antihypertensives. 3,872,169, Cl. 260-558.00A.

Bellis, Harold Edward, to du Pont de Nemours, E. I., and Company. Production of dichloroethylene using melt chlorination process. 3,872,174, Cl. 260-654.00R.

Belot, Michel: *See—*
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Benjamin, Le Roy. Picture and lamp holding bracket assembly. 3,871,609, Cl. 248-496.000.

Bennett, Robert A. Unitary molded swabs. 3,871,375, Cl. 128-269.000.

Benton, William J.; and Quigley, Joseph R. Polyurethane liquid crystal dispersion system and devices. 3,872,050, Cl. 260-37.00N.

Bentsen, Louis J., to Honeywell Inc. Air flow amplifier. 3,871,396, Cl. 137-85.000.

Benz, Leo; Klein, Dieter; Bauer, Manfred; Figel, Albert; and Treutlin, Rolf, to Alois Zettler Elektrotechnische Fabrik GmbH. Hospital communication system. 3,872,440, Cl. 340-171.00R.

Bereziat, Andre, to Astra Plastique. Closure devices for containers. 3,871,545, Cl. 215-249.000.

Berg, Joseph E., to Precision Thin Film Corporation. Validated drop test apparatus. 3,871,208, Cl. 73-12.000.

Berg, Leif; and Nes, Ragnar Jonas, to Ingeniorene Lund, Mohr & Giaever-Enger. Apparatus for counteracting a tilting of a ships's hull during loading and unloading. 3,871,320, Cl. 114-121.000.

Berg, Thorval L.: *See—*
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Bergey, John M. Solid state watch display switch. 3,871,170, Cl. 58-50.00R.

Berglund, Jan, to AB Husqvarna Borstfabrik. Self-watering plant pots or receptacles. 3,871,131, Cl. 47-38.100.

Bergman, Samuel, to Lawrence Peska Associates, Inc. Reflective animal collar and leash. 3,871,336, Cl. 119-106.000.

Bergmeyer, Hans Ulrich; Nelboeck-Hochstetter, Michael; Michal, Gerhard; Muhlegger, Klaus; Weimann, Gunter; and Roesch, Egon, to Boehringer Mannheim G.m.b.H. Substituted purineribofuranoside-3,5-cyclophosphate compounds and process for their preparation. 3,872,082, Cl. 260-211.50R.

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Berkowitz, Sidney; and Mesiah, Raymond, to FMC Corporation. Preparation of sodium dichloroisocyanurate dihydrate composition. 3,872,118, Cl. 260-248.00C.

Berlich, Bodo, to Danfoss A/S. Rotary and orbiting piston machine with internal shaft. 3,871,798, Cl. 418-39.000.

Bernhoft, Gerald W.; and Miller, David A., to Koehring Company. Control for mobile construction machine. 3,871,537, Cl. 214-140.000.

Berry, James Simmons, Jr., to Reynolds Metals Company. Transmission of pot line control signals. 3,871,984, Cl. 204-228.000.

Bertele, Erhard; and Schudel, Peter, to Givaudan Corporation. Process for preparation of terpene flavorants and novel intermediates therefor. 3,872,172, Cl. 260-601.00R.

Berthoux, Jean; and Schwachhofer, Ghislain, to Progil. Process of manufacturing para-tert-butyl-phenol. 3,872,173, Cl. 260-624.00E.

Bertino, Lorenzo: *See—*
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Bertram, Joachim; and Meuser, Wilfried, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Magnetic field measuring apparatus with frequency independent sensitivity. 3,872,382, Cl. 324-43.00R.

Berz, Max; and Berz, Wolfgang, to Berz, Wolfgang. Dust filter arrangement. 3,871,846, Cl. 55-303.000.

Berz, Wolfgang: *See—*
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Besenfelder, Edward R.; and Friedman, Stanley I., to Honeywell Information Systems Inc. Apparatus for detecting data bits and error bits in phase encoded data. 3,872,431, Cl. 340-146.1AX.

Bessiere, Pierre Etienne, to Labavia S.G.E. Transmissions of vehicles equipped with a retarder. 3,871,466, Cl. 180-70.00P.

Bessiere, Pierre Etienne, to Labavia - S.G.E. Vehicle brake installations. 3,871,497, Cl. 192-3.0TR.

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Bibring, Herve E.; Seibel, Georges P.; and Rabinovitch, Maurice, to Office National d'Etudes et de Recherches Aerospatiales. Refractory composite alloys containing rod-like and/or platelet-like lamellae. 3,871,835, Cl. 29-191.200.

Biddle, Milburn Emmett. Rain wheel. 3,871,582, Cl. 239-233.000.

Biewinga, Siewert Gerrit Jan, to Hoogovens Ijmuiden B.V. Burning device for burning ore pellets and similar bodies. 3,871,631, Cl. 266-21.000.

Bigelow-Sanford, Inc.: *See—*
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Bildner, Heinz. Radial ski having a profiled running surface. 3,871,671, Cl. 280-11.13E.

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Bishop, Wayne C., to FMC Corporation. Skimming blade. 3,872,017, Cl. 210-525.000.

Bismarck, Otto Herbert, to International Telephone and Telegraph Corporation. Synchronization circuit for a viterbi decoder. 3,872,432, Cl. 340-146.1AQ.

Bivins, Jim. Combination ear plug and ear plug retainer. 3,871,372, Cl. 128-152.000.

Black and Decker Manufacturing Company, The: *See—*
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Blackwelder, Maurice W., to Owens-Illinois, Inc. Dressing ring for tubular expanded polystyrene cooling mandrel. 3,871,802, Cl. 425-72.000.

Blaimschein, Gottfried: *See—*
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Bland, Maria A., administratrix: *See—*
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Bland, Reginald B., deceased (by Bland, Maria A., administratrix). Stirling cycle engine with catalytic regenerator. 3,871,179, Cl. 60-526.000.

Blank, Wallace J.; and Watson, Thomas H., to Oshkosh Truck Company. Heavy duty truck suspension. 3,871,677, Cl. 280-104.50A.

Blaser, Alfred, to W. R. Grace & Co. Apparatus and method for wrapping confectionery articles. 3,871,155, Cl. 53-28.000.

Blaupunkt-Werke GmbH: *See—*
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Bleickardt, Werner Heinrich; and Robrock, Richard Barker, II, to Bell Telephone Laboratories, Incorporated. Multiplex and demultiplex apparatus for digital-type signals. 3,872,257, Cl. 179-15.0BS.

Bliss, Robert A, to Hoerner Waldorf Corporation. Game carton. 3,871,654, Cl. 273-136.00C.

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Bobrick Corporation, The: *See*—
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Boden, Philip; Crook, Peter John; Hall, Michael Edgar; and Riley, Stephen Philip, to Fibreglass Limited. A foamed reaction product of a resale with a sulfonated novolac. 3,872,033, Cl. 260-2.50F.

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Boenisch, Dietmar. Apparatus for mixing materials. 3,871,623, Cl. 259-2.000.

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Bogdanski, Stanley: *See*—
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Bohm, Harald; and Heffler, Jochen, to Licentia Patent-Verwaltungs G.m.b.H. Gas diffusion electrode for electrochemical cells. 3,871,922, Cl. 136-120.0FC.

Boice, Michael F.; and Krag, Niels, to Electronics Memories & Magnetics Corporation. Skewed core matrix. 3,872,454, Cl. 340-174.00M.

Boisvert, Roger L., to General Electric Company. Adjustable lampholder with articulated swivel mount. 3,872,428, Cl. 240-52.100.

Bolduc, Lee R.; and Dickhudt, Eugene A., to Population Research Incorporated. Dispensing instrument and method. 3,871,374, Cl. 128-235.000.

Boles, John A.; Chu, Charles M.; Criswell, Peter B.; and Rolnitzky, Aron, to Sperry Rand Corporation. System for conversion between coded byte and floating point format. 3,872,442, Cl. 340-172.500.

Boll, Richard H., to Babcock & Wilcox Company, The. Radiation sensitive fluid analyzer. 3,872,315, Cl. 250-575.000.

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Bond, Charles R. Pneumatic flip-flop relay. 3,872,270, Cl. 200-83.00P.

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Bosse, Robert W., to Groov-Pin Corporation. Locking self-tapping threaded stud insert assembly and method. 3,871,429, Cl. 151-14.00R.

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Breer, Karl; and Nadolski, Klaus, to Bayer Aktiengesellschaft. Machine for filling moulds or cavities with a free-flowing mixture of reaction components. 3,871,556, Cl. 222-132.000.

Brekken, Roger A., to Minnesota Mining and Manufacturing Company. Biaxially oriented polyethylene terephthalate film having a surface suitable for writing thereon. 3,871,947, Cl. 161-116.000.

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Brown, Morris C.; Cook, Forrest W.; Kalert, Ralph E.; Vollmer, Arthur C.; and Winkley, Jerry H., to ACF Industries, Incorporated. Apparatus for controlling and modulating engine functions. 3,872,189, Cl. 261-39.00A.

Brown, Morris C.; Cook, Forrest W.; Kalert, Ralph E.; Vollmer, Arthur C.; and Winkley, Jerry H., to ACF Industries, Incorporated. Apparatus for controlling and modulating engine functions. 3,872,190, Cl. 261-39.00A.

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Jakubowski, Heinz; and Leutwein, Klaus, 3,872,303.
Carlson, David John; and Hilliker, Stephen Earl, to RCA Corporation. Pickup apparatus for capacitive video disc players with transmission line tuned circuit. 3,872,240, Cl. 178-6.60R.
Carlson, Richard L.; and Richardson, William L. Motor vehicle light guard. 3,872,427, Cl. 340-52.00D.
Carlsson, David J.; Suprunchuk, Tony; and Wiles, David M., to Canadian Patents and Development Limited. Photostabilization of polymers. 3,871,901, Cl. 117-47.00A.
Carmassi, Michel: *See—*
Andral, Guillaume; Carmassi, Michel; Louvel, Bernard; Maurice, Jacques; and Vandesande, Georges, 3,871,831.
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Carpenter, David M., to Coats Company, Inc., The. Adaptor for tire changing stands. 3,871,433, Cl. 157-1.240.
Carrington, Henry A.; and Kruse, Robert O. Deer skinning apparatus and method of using same. 3,871,084, Cl. 17-21.000.
Carson Manufacturing Company, Inc.: *See—*
Smith, Gerald D.; and Owens, Frank R., 3,872,353.
Carter, Clyde Thomas, to AMP Incorporated. Connectors providing interconnection between closely spaced conductors and widely spaced terminals. 3,871,736, Cl. 339-221.00R.
Carter, James L.: *See—*
Sinfelt, John H.; Barnett, Allan E.; and Carter, James L., 3,871,997.
Casey, William J. Game apparatus. 3,871,650, Cl. 273-87.00R.
Castillo, Adolfo: *See—*
Jureit, John Calvin; Castillo, Adolfo; and Rionda, Carlos, 3,871,213.
Castonguay, Leon H., to Astratronics, Inc. Switch. 3,871,473, Cl. 180-104.000.
Caterpillar Tractor Co.: *See—*
Boggs, Roger L., 3,871,719.
Krolak, Ronald L.; Gianessi, Albert; and Alexander, George F., 3,871,462.
Unruh, Dale H.; and Yates, Jan B., 3,871,635.
Cavil, David T., to Outboard Marine Corporation. Capacitive discharge ignition system for internal combustion engines. 3,871,348, Cl. 123-148.00E.
Celanese Corporation: *See—*
Boom, Abraham A., 3,872,278.
Davis, Howard J.; and Lee, Leonard A., 3,872,001.
Cellarius, Hans Joerg: *See—*
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Century Wheels, Inc.: *See—*
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Cerberus AG.: *See—*
Scheidweiler, Andreas, 3,872,449.
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Cestaro, Victor L. Opto-electronic security system. 3,872,435, Cl. 340-147.0MD.
Chadfield, Robert; and Lang, Frank J., to Federal Package Corporation. Double-wall jar. 3,871,543, Cl. 215-13.00R.
Chamberlin, Thomas A.: *See—*
Kochanny, Gerald L., Jr.; and Chamberlin, Thomas A., 3,872,176.
Chambers, Charles W., Jr., to Lorain Products Corporation. Voltage booster circuit for telephone systems. 3,872,258, Cl. 179-16.00F.
Chambers, Derek, to Raytheon Company. Visual display system. 3,872,446, Cl. 340-172.500.
Champion International, Corporation: *See—*
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Chapman, Charles C., to Phillips Petroleum Company. Apparatus for purifying HF. 3,871,969, Cl. 202-234.000.
Chapman, Charles C., to Phillips Petroleum Company. Production of ethyl fluoride for hf alkylation. 3,872,181, Cl. 260-683.490.
Charbonney, Adrien Maurice, deceased (by Thorens, Jean-Jacques, legal representative); Perucchi, Norbert; Belot, Michel; and Giger, Urs, to Ebauches S.A. Mechanism for driving a rotating jumping member in a timepiece. 3,871,171, Cl. 58-116.00R.
Charcon Tunnels Limited: *See—*
Cardwell, William Thomas; Hawke, Francis Murray; and Gibson, Peter Gordon, 3,871,183.
Charlton, John Stuart; and Ross, John Francis, to Imperial Chemical Industries Limited. Detection of corrosion by a radiometric technique. 3,872,310, Cl. 250-358.000.
Chauvier, Jean-Marie, to Solvay & Cie. Polymerization reactor having a closed upper chamber portion of reduced diameter and polymerization process therein. 3,871,830, Cl. 23-285.000.
Chemcut Corporation: *See—*
Goffredo, Daniel L.; and Dunkelberger, John Alfred, Jr., 3,871,914.
Chemical Construction Corporation: *See—*
Villiers-Fisher, John F.; and Coles, Edward T., 3,871,172.
Chemische Werke Huels Aktiengesellschaft: *See—*
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Chemix Corporation: *See—*
Marshall, Arthur R., 3,871,627.
Cherdron, Egon; Forster, Hans-Joachim; Potencsik, Istvan; and Haerter, Manfred, to Gebruder Giulini GmbH. Phosphate purification process. 3,872,215, Cl. 423-309.000.
Chesney, John: *See—*
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Friberg, Vincent P.; and Chesney, John, 3,872,399.
Chiappe, Wayne T., to Continental Can Company, Inc. Push-in easy opening container. 3,871,550, Cl. 220-339.000.
Chibata, Ichiro; Yamada, Shigeki; Wada, Mitsuru; Maeshima, Haruko; and Izuo, Nobuhiko, to Tanabe Seiyaku Co., Ltd. Fermentative production of d-alanine. 3,871,959, Cl. 195-29.000.
Chicago Bridge & Iron Company: *See—*
Walker, James Donald, 3,872,003.
Chikama, Toshio, to Kabushiki Kaisha Machida Seisakusho. Endoscope. 3,871,365, Cl. 128-5.000.
Childress, Lloyd Krudop, Jr.; and Church, John Allen, to International Business Machines Corporation. Magnetic tape cleaning and tensioning apparatus. 3,872,510, Cl. 360-137.000.
Chipman, Gary R.: *See—*
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Chizat, Francois: *See—*
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Christensen, Robert F.: *See—*
Wilson, Johnnie; and Christensen, Robert F., 3,871,125.
Christmann, Harold F.; and Teel, Paul H., to Petro-Tex Chemical Corporation. Oxidative dehydrogenation catalysts and their method of preparation. 3,872,027, Cl. 252-430.000.
Chrysler Corporation: *See—*
Tomlinson, Patrick W.; Chandler, James P.; and Scott, Mark W., 3,871,474.
Chu, Charles M.: *See—*
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Ciarico, Anthony J., to Kendall Company, The. Flow measuring device. 3,871,231, Cl. 73-215.000.
Ciba-Geigy AG: *See—*
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Ciecior, Heinrich; and Kessler, Rolf Emil, to Singer Company, The. Adjustable eccentric for sewing machines. 3,871,311, Cl. 112-200.000.

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Pasqualucci, Carmine Renato; Bonfanti, Giovanni; Giovanni, Sesto San; and Cignarella, Giorgio, 3,872,088.

Cioffi, William F. Safety book match cover. 3,871,517, Cl. 206-108.000.

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Citizen Watch Company Limited: *See*—
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Claassen, George R., to PPG Industries, Inc. Apparatus for press bending glass sheets. 3,871,857, Cl. 65-273.000.

Claesson, Harry, to Allmanna Svenska Elektriska Aktiebolaget. Forging press. 3,871,202, Cl. 72-60.000.

Clancy, William B. Apparatus for inspecting confined areas adjacent the floor. 3,872 295, Cl. 240-2.180.

Clarke, David E., to Texas Instruments Incorporated. Relay. 3,872,415, Cl. 337-140.000.

Clarke, Henry C. N. Laparoscopy instruments and method for suturing and ligation. 3,871,379, Cl. 128-326.000.

Clarke, Ralph H.; Clarke, Wesley James; and Mays, Steven L., to Clarke's Sheet Metal, Inc. Industrial air filter. 3,871,845, Cl. 55-284.000.

Clarke, Wesley James: *See*—
Clarke, Ralph H.; Clarke, Wesley James; and Mays, Steven L., 3,871,845.

Clarke's Sheet Metal, Inc.: *See*—
Clarke, Ralph H.; Clarke, Wesley James; and Mays, Steven L., 3,871,845.

Clason, Jan Christiaan, to Hazemeijer B.V. Vacuum circuit interruptor including a gettering device. 3,872,271, Cl. 200-144.00B.

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Clave, Marcel: *See*—
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Clave, Serge; and Clave, Marcel. Compact optical system permitting instantaneous increase in magnification without refocussing. 3,871,741, Cl. 350-37.000.

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Clerk, Ernest Joscelyn. Antifriction device for boat hulls. 3,871,318, Cl. 114-67.00A.

Cleveland, James Leonard; Jones, Richard Alfred; Larson, Theodore Edwin; McNary, Kenneth Rogers; and Zahorsky, James Theodore, to International Business Machines Corporation. Terminal control unit. 3,872,444, Cl. 340-172.500.

Coats Company, Inc., The: *See*—
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Cohen, Alain; and Lalli, Orfelio, to Lightolier Incorporated. Recessed lighting fixture. 3,872,296, Cl. 240-73.0BC.

Coker, John Norman; and Power, Basil Dixon. Vacuum seals. 3,871,668, Cl. 277-180.000.

Coleco Industries, Inc.: *See*—
Zimmers, Melvin; and Gerber, Gary A., 3,871,655.

Coles, Edward T.: *See*—
Villiers-Fisher, John F.; and Coles, Edward T., 3,871,172.

Coller, John A.; Millman, Irving; and Blumberg, Baruch S., to United States of America, Health, Education and Welfare. Process of viral diagnosis and reagent. 3,872,225, Cl. 424-1.000.

Collier, Sidney Wellington, to Syd W. Collier Co. Ltd. Machine for cleaning carpets and the like. 3,871,051, Cl. 15-321.000.

Collins, Byron R., to General Electric Company. High temperature lamp starting aid. 3,872,340, Cl. 313-198.000.

Collins, Delmas E., to Jones-Zylon, Inc. Container device for dispensing liquids. 3,871,555, Cl. 222-131.000.

Collman, James P.; Winter, Stanley R.; and Komoto, Robert G., to Leland Stamford Junior University, The Board of Trustees of the. Synthesis of acids and amides. 3,872,168, Cl. 260-539.00R.

Collman, James P.; and Winter, Stanley R., to Leland Stanford Junior University, The Board of Trustees of the. Synthesis of alkali metal tetracarbonylferrates. 3,872,218, Cl. 423-417.000.

Coltrinari, Enzo L.: *See*—
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Comer, William Timmey: *See*—
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Commissariat A L'Energie Atomique: *See*—
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Community Health Computing, Inc.: *See*—
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Compagnie Industrielle Des Piles Electriques "Cipel": *See*—
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Conacher, Philip, Jr., to E. I. de Pont de Nemours and Company. Non-discoloring painted polyurethane. 3,871,911, Cl. 117-138.80D.

Conklin, Robert M.: *See*—
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Connolly, John F., to Standard Oil Company. Electrochemical adiponitrile process. 3,871,976, Cl. 204-73.00A.

Consolidation Coal Company: *See*—
Jamison, Will B.; Burr, John F.; and Hadi, Homayoun, 3,871,302.
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Container Corporation of America: *See*—
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Cook, Rodney G. Animal Trap. 3,871,124, Cl. 43-88.000.

Cooley, Austin G., to Litton Medical Products, Inc. Facsimile flatbed transceiver. 3,872,242, Cl. 178-6.000.

Cooley, Richard F., to Owens-Illinois, Inc. Laser assembly including a crystalline laser disc with an annular glass coating. 3,872,401, Cl. 331-94.50E.

Cooper, Abraham. Dental restoration jig. 3,871,804, Cl. 425-175.000.

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Cooper, Jamshed Rustom; and Svendsen, Walter W., to Longyear Company. Wire line soil sampler apparatus. 3,871,487, Cl. 175-248.000.

Corbett, Roger Patrick: *See*—
Legge, Morris James; Phipps, John Alastair; and Corbett, Roger Patrick, 3,871,580.

Corcoran, Richard P.; Hirtler, Alfred E.; and Mittel, Robert F., to North America Philips Corporation. Including a semiresonant slotted mode stirrer. 3,872,276, Cl. 219-10.55H.

Core, William Roger. Safety lock for cabinet doors and the like. 3,871,693, Cl. 292-67.000.

Costantini, Michel: *See*—
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Cotrel, Yves Paul Charles. Device for pulling the rachis. 3,871,366, Cl. 128-75.000.

Cotter, Mitchell A., to APM Corporation. Audio response device with orthogonal scan of multiple tracks on playback. 3,872,264, Cl. 179-100.30B.

Coulter, David C. Method and system for speech compression. 3,872,250, Cl. 179-1.0SA.

Courant, Jacques, to Societe Zenith-Aviation. Fluid-tight and separable coupling, liquid-filling devices for reservoirs. 3,871,404, Cl. 137-614.030.

Coutin, Pierre Fernand. Retractable jettisoning ejector for aircrafts. 3,871,604, Cl. 244-137.00R.

Crabbe, Pierre, to Syntex (U.S.A.) Inc. Difluoromethylene substituted prostaglandin intermediates. 3,872,107, Cl. 260-343.300.

Crabbe, Pierre, to Syntex (U.S.A.) Inc. 9-Hydroxy prosta-5-cis, 11,13-trans-trienoic acids and derivatives thereof. 3,872,149, Cl. 260-468.00D.

Cragar Industries, Inc.: *See*—
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Crago, William Arthur; and Emmerson, Derek Martin, to British Hovercraft Corporation Limited. Navigation training simulators. 3,871,113, Cl. 35-10.200.

Craven, Donald R., to Babcock & Wilcox Company, The. Machine tools. 3,871,246, Cl. 74-665.0GD.

Crawford, Thomas G.; and Kearse, William E., to Westinghouse Electric Corporation. Composite structure and high speed bobbin. 3,871,601, Cl. 242-118.320.

Cresswell, Michael W.: *See*—
Roberts, John S.; and Cresswell, Michael W., 3,872,493.

Crew, Wynn D., to Microtech Press Inc. Reader-selector instrument for ultra-high reduction microfilm. 3,871,759, Cl. 353-95.000.

Cri-Dan: *See*—
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Crinos Industria Farmacobiologica S.p.A.: *See*—
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Crippa, Jean-Pierre, to Les Produits Associes, SA. Reservoir for a liquid pump including means for initially forcing liquid into the pump. 3,871,560, Cl. 222-325.000.

Crippen, Monte D.; and Mentz, Bernardus J., to Hooker Chemical & Plastics Corp. Luggin tip block assembly and use in electrolytic cells. 3,871,985, Cl. 204-231.000.

Crippen, Monte D.: *See—*
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Criswell, Peter B.: *See—*
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Criswell, Thomas R.: *See—*
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Critchfield, Robert E. Coin-operated clock alarm. 3,871,502, Cl. 194-9.00T.

Cronin, Timothy H.; Faubl, Hermann; Hoffman, William W.; and Korst, James J., to Pfizer Inc. Polyamines as antiviral agents in animals. 3,872,171, Cl. 260-584.00R.

Crook, James D.: *See—*
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Crook, Peter John: *See—*
Boden, Philip; Crook, Peter John; Hall, Michael Edgar; and Riley, Stephen Philip, 3,872,033.

Crooke, Arthur W.; and Schottler, Paul H., to Sperry Rand Corporation. Finite impulse response digital filter with reduced storage. 3,872,290, Cl. 235-152.000.

Crosfield Electronics Limited: *See—*
Astley, Edward T., 3,872,348.

Cross, Charles, to Robertshaw Controls Company. Supervisory control system. 3,872,437, Cl. 340-147.0SY.

Crossman, Phillip E.; Kenrick, Robert C.; and LeMieux, Robert W., to Brunswick Corporation, The. Air bed. 3,871,585, Cl. 239-553.300.

Crowe, Talmadge L., to Baker Oil Tools, Inc. Tubing hanger setting tool. 3,871,447, Cl. 166-120.000.

Crowley, Walter A. Skirt for air cushion vehicle. 3,871,476, Cl. 180-127.000.

Crysdyn Corporation: *See—*
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Cseh, Georg; and Muller, Willy, to Ciba-Geigy Corporation. Disazo pigments, processes for their manufacture and use. 3,872,078, Cl. 260-176.000.

Culbertson, George S.; Chipman, Gary R.; and Karll, Robert E., to Standard Oil Company. Oil-soluble lubricant bi-functional additives from mannich condensation products of oxidized olefin copolymers, amines and aldehydes. 3,872,019, Cl. 252-51.50A.

Cupo, William J. Carton, carton blank and method of assembling the carton. 3,871,571, Cl. 229-39.00R.

Curington, Alfred R.; and Roscoe, Theodore J., Jr., to Bakerdrill, Inc. Continuous coring system and apparatus. 3,871,486, Cl. 175-100.000.

Curtis, Ralph H. Burglar and warning alarm and system. 3,872,459, Cl. 340-276.000.

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Cuttill, William E.; and Wagner, Vilma M. Credit card and credit card identification system for automatic vending equipment. 3,872,438, Cl. 340-149.00A.

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Dacey, Dennis N.: *See—*
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Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
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Daikin Kogyo Co., Ltd.: *See—*
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Dail, Elwood C. Foot actuated press. 3,871,055, Cl. 29-267.000.

Dailly, Georges Paul; and Lefebvre, Raymond Marcel. Automatic central buffer couplings for rail vehicles. 3,871,531, Cl. 213-100.00W.

Daimler-Benz Aktiengesellschaft: *See—*
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Daishowa Seiki Co., Ltd.: *See—*
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Dakss, Mark L.: *See—*
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Dalley, James Edwin, to Bell Telephone Laboratories, Incorporated. Balanced line driver. 3,872,391, Cl. 330-14.000.

Dalpak Corporation, The: *See—*
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Dandois, Joseph E.: *See—*
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Danfoss A/S: *See—*
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Daniels, Leander Bruce; and Azbell, James W., to MI^2. Automatic dialer. 3,872,467, Cl. 340-364.000.

Daniels, Peter J. L., to Schering Corporation. Process for the preparation of garamine and intermediates produced thereby. 3,872,080, Cl. 260-210.00R.

Danker & Wohlk, Inc.: *See—*
Cappeli, Quido A., 3,871,813.

Dankert, Carolyn H. Cabinet. 3,872,342, Cl. 312-290.000.

Das, Nalini R.; and Strain, Edwin H., to Raytheon Company. Electric ignition system. 3,871,814, Cl. 431-66.000.

Data Service of America, Inc.: *See—*
Fletcher, John H., 3,871,229.

Daubach, Ewald; Windel, Hermann; Boehm, Walter; Weiser, Dieter; and Herrmann, Manfred. Manufacture of phenol/formaldehyde resins. 3,872,056, Cl. 260-49.000.

David, Harry, to Hauni-Werke Korber & Co., KG. Apparatus for building a tobacco stream. 3,871,385, Cl. 131-84.00B.

Davidson, Donald L.; and Romanowich, Donald K., to Spruce Falls Power and Paper Company Limited. Pulpwood ejector. 3,871,512, Cl. 198-128.000.

Davidson, Harley R.: *See—*
Davis, Austin L.; and Davidson, Harley R., 3,871,490.

Davidson, Samuel L.; Heidenreich, William C.; and Hunter, Phillip, to Delhi Manufacturing Company. Boat structure. 3,871,043, Cl. 9-6.000.

Davis, Austin L.; and Davidson, Harley R. Weighing and printing apparatus. 3,871,490, Cl. 177-10.000.

Davis, Curry Beach: *See—*
Thorpe, Susan Dale; Davis, Curry Beach; and Wheelus, Charles Glenn, 3,872,073.

Davis, Gordon Peter; and Wardley, John, to EMI Limited. Electron multiplier formed by twisting fingers in parallel plates. 3,872,337, Cl. 313-95.000.

Davis, Howard J.; and Lee, Leonard A., to Celanese Corporation. Removal of heavy metal pollutants from aqueous media. 3,872,001, Cl. 210-58.000.

Davis, John R., Jr.; and Krishna, Surinder, to Westinghouse Electric Corporation. Field-contoured high speed, high voltage transistor. 3,872,494, Cl. 357-34.000.

Dawson, Stuart Bruce: *See—*
Taft, Philip Augustus; and Dawson, Stuart Bruce, 3,871,678.

Dawson, William H., Jr., to United States of America, Navy, Sonic means for detecting compressor stall. 3,872,292, Cl. 235-151.300.

Day, Christopher C., to American Optical Corporation. Pacer diagnostic instrument. 3,871,363, Cl. 128-2.06R.

Day, David John, to Rank Organisation Limited, The. Anamorphotic optical objective. 3,871,748, Cl. 350-181.000.

De la Cierva, Juan J. Device for the mechanical stabilization of the alignment of instruments. 3,871,236, Cl. 74-5.220.

Dean, J. Thomas. Bracket placer. 3,871,098, Cl. 32-66.000.

De Belder, Maurice Hector; Bollen, Romain Henri; and Van Esch, Robert Florent, to Agfa-Gevaert, N.V. Radiographic intensifying screens. 3,872,309, Cl. 250-483.000.

De Brabander, Jean, to Velcro S.A. Process for the industrial manufacture of fabrics, strips or ribbons and the so manufactured products. 3,871,933, Cl. 156-88.000.

De Bucs, Eugen Szabo: *See—*
Henkel, Hans-Joachim; De Bucs, Eugen Szabo; and Koch, Christian, 3,871,838.

Dechelette, Helen, to AMP Incorporated. Fuse contacts. 3,871,738. Cl. 339-256.00C.

DeChristopher, Phillip J.: *See—*
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Degenkolbe, Adolf: *See—*
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Deggendorfer Werft und Eisenbau GmbH: *See—*
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Dehnert, Douglas K., to Arctic Enterprises, Inc. Snowmobile frame. 3,871,460, Cl. 180-5.00R.

De Hollander, William R.; and Nivas, Yogesh, to General Electric Company. Sintering uranium oxide in the reaction products of hydrogen-carbon dioxide mixtures. 3,872,022, Cl. 252-301.10R.

De Jong, Maarten Cornelis: *See—*
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Delbag Luftfiler GmbH: *See—*
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Delhi Manufacturing Company: *See—*
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DeLong Corporation: *See—*
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DeLong, Leon B., to DeLong Corporation. Method of forming an enclosure in a body of water. 3,871,181, Cl. 61-34.000.

Deltrol Corp.: *See—*
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DeLuca, Paul V.: *See—*
Manos, George; DeLuca, Paul V.; Santulli, Vincent F.; and Carney, William V., 3,872,259.

DeMattie, David A.; and Fago, Anthony. Battery housing with handle for stacking. 3,871,924, Cl. 136-166.000.

Demmler, Kurt: *See—*
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Den Bleyker, John R.: *See—*
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Denis, Etienne Marie; and Holper, Roland, to Centre National De Recherches Metallurgiques. Monitoring and control of pig iron refining. 3,871,871, Cl. 75-60.000.

Denki Kagaku Kogyo K.K.: *See*—
Horiie, Shigeki; Kurematsu, Susumu; and Asai, Shin-ichiro. 3,872,068.

Dennison Manufacturing Co.: *See*—
Anemaet, John M., 3,871,329.

Depauw, Richard A.; and Hawkins, Robert W., to International Harvester Company. Removable concave for an axial flow-type combine and adjusting means therefor. 3,871,384, Cl. 130-27.00T.

Der Estephanian, Estephan. Window opening protective grill. 3,871,151, Cl. 52-507.000.

Dergazarian, Thomas E.: *See*—
Staudacher, Gerald R.; Dergazarian, Thomas E.; and Lane, George A., 3,871,684.

Desnos, Monique: *See*—
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Despatch Industries, Inc.: *See*—
Melgaard, Hans; and Plapp, Nile E., 3,872,473.

Dettoni, Giorgio, to Officine Meccaniche Agudio S.p.A. Suspension apparatus for endless monocable and bicable aerial ropeways with clamp control. 3,871,304, Cl. 104-178.000.

Deuterium Corporation: *See*—
Spevack, Jerome S., 3,872,223.

Devitt, Lloyd Raymond. Automatic slack adjuster for air brakes. 3,871,495, Cl. 188-79.50K.

Dial, Darrell D.; and von Bose, Robert J., to Halliburton Company. Integral coupler centering device. 3,871,529, Cl. 213-21.000.

Dialysis Systems Limited: *See*—
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Diamagnetics, Inc.: *See*—
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Diamond, Warren: *See*—
Seligman, Herbert L.; Schwartz, Marvin; and Diamond, Warren, 3,872,284.

Dian, Walter; and Wrobel, Charles V., to Beatrice Foods Company. Wide flange bicycle hub. 3,871,710, Cl. 301-105.00B.

Dickert, Eugene A., to Cook Paint & Varnish Company. Phenolic foam. 3,872,034, Cl. 260-2.5AM.

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Dictaphone Corporation: *See*—
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Dierssen, Gunther H., to Minnesota Mining and Manufacturing Company. Process for producing a parallel overgrowth for use as an epitaxial thin film laser. 3,871,912, Cl. 117-201.000.

Dietz, Earl D.; and Wengert, Paul R., to Owens-Illinois, Inc. Method of melting glass in a platinum container in a controlled atmosphere. 3,871,853, Cl. 65-32.000.

Digital Equipment Corporation: *See*—
Van De Goor, Adrianus J.; and Hughes, Leonard B., 3,871,578.

Dimroth, Peter; Redeker, Joerg; and Lotsch, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Azo pigments form a 1-aminoanthraquinone diazo component and a phthalimidacetoacetanilide coupling. 3,872,077, Cl. 260-152.000.

Distugil: *See*—
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Dively, Robert C., to Environmental Products Inc. Aerating apparatus having ballast means therefor. 3,871,581, Cl. 239-16.000.

Dobryakova, Natalia Alexandrovna: *See*—
Vul, Alexandr Yakovlevich; Shik, Alexandr Yakovlevich; Dobryakova, Natalia Alexandrovna; Saidashev, Ibragim Ibragimovich; and Shmartsev, Jury Vasilievich, 3,872,300.

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Dodge, Marlow W. Snubber for the dagger board of a sailboat. 3,871,322, Cl. 114-127.000.

Dodson, George Bertram, III, to RCA Corporation. Radiation sensing circuit. 3,872,329, Cl. 307-311.000.

Dohmeier, Hans Otto, to Dome Inventions Limited. Protective chains. 3,871,431, Cl. 152-243.000.

Dome Inventions Limited: *See*—
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Dominguez-Burguette, Mario, to Minnesota Mining and Manufacturing Company. Integral composite element useful in electrostatic clutch or brake devices. 3,871,944, Cl. 161-42.000.

Domke, Klaus; Lau, Peter; and Glas, Willi, to Fr. Hesser Maschinenfabrik AG. Bag packaging apparatus with protective atmosphere. 3,871,157, Cl. 53-110.000.

Donnan, Robert Anderson: *See*—
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Donner, Verne P., to Deltrol Corp. Solenoid operated wedge gate valve. 3,871,615, Cl. 251-129.000.

Dorosz, Adolph S.; Schaefer, Hans F., Jr.; and Sprague, Gordon V., Jr., to USM Corporation. Workpieces moving apparatus. 3,871,532, Cl. 214-1.0BB.

Dorr-Oliver Incorporated: *See*—
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Dorre, Erhard, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Ceramic reinforced helmet. 3,871,026, Cl. 2-6.000.

Dorrell, Robert Francis; and Anderson, Norman Richard, to Bunker Ramo Corporation. Socket contact with conductive elastomer contacting surface. 3,871,737, Cl. 339-255.00R.

Dorschner, Kenneth P.; and Bordenca, Carl, to SCM Corporation. Phytocidal compositions containing n-heterocylic ethers. 3,871,863, Cl. 71-88.000.

Doughty, Joseph B., to Westvaco Corporation. Lignin amines as asphalt emulsifiers. 3,871,893, Cl. 106-277.000.

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Drew, John, to SCM Corporation. Turpentine recovery by steam distilling woodchips while they are immersed. 3,871,951, Cl. 162-14.000.

Duchene, Joseph R.; and DeChristopher, Phillip J., to Richardson Chemical Company, The. Alkaline bright zinc plating. 3,871,974, Cl. 204-55.00R.

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Duhaut, Pierre; and Miquel, Jean, to Societe Francaise Des Produits Pour Catalyse. Reforming process using platinum-indium-thallium or indium catalyst. 3,871,995, Cl. 208-138.000.

Dujardin, Esther: *See*—
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Dumazet, Eugene, to Societe Ethylene Plastique. Device for suppressing the ignition or explosion of escaping combustible gases under high pressure. 3,871,458, Cl. 169-45.000.

Duncan, Robert C.; and Smith, Grace L., to Procter & Gamble Company, The. Absorbent bandage. 3,871,378, Cl. 128-290.000.

Dunegan, Gerald W. Body temperature and heat rate measurement system. 3,871,362, Cl. 128-2.06F.

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Viktor Ivanovich; Golovinov, Mikhail Fedotovich; Erokhov, Veniamin Kuzmich; and Starostin, Jury Stepanovich. 3,871,407.

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Ellion, M. Edmund; and Mahaffy, Dwight A., to Hughes Aircraft Company. Hydrazine gas generator. 3,871,828, Cl. 23-281.000.

Elson, Edward E.; and Goldsmith, Aaron, to Automatic Helium Balloon Systems, Inc. Dual balloon valve. 3,871,422, Cl. 137-231.000.

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Estruco, Jose. Method of protection for slopes and crests of rivers, channels, and the like. 3,871,182, Cl. 61-38.000.

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Falco, Guy N., to Zenith Radio Corporation. Packaged surface wave selective circuit device and method of making the same. 3,872,331, Cl. 310-9.400.

Falgayrettes, Michel; Pontier, Robert; and Sauvage, Michel. Method and a device for combating sodium fires. 3,871,459, Cl. 169-49.000.

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Glazar, Arthur J., to Servo Corporation of America. Two-level multiplex alarm monitor for hot box detector system. 3,872,456, Cl. 340-231.000.

Gloge, Detlef Christoph; and Smith, Peter William, to Bell Telephone Laboratories, Incorporated. Method of encapsulating and terminating the fibers of an optical fiber ribbon. 3,871,935, Cl. 156-158.000.

Gnutzmann, Uwe: *See—*
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Godber, Geoffrey Allan, to Plessey Incorporated. Method for selectively etching silicon nitride. 3,871,931, Cl. 156-7.000.

Goffredo, Daniel L.; and Dunkelberger, John Alfred, Jr., to Chemcut Corporation. Etchant rinse apparatus. 3,871,914, Cl. 134-109.000.

Gogniat, Theodore: *See—*
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Golay, Roland: *See—*
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Gold, Nicholas, to Polaroid Corporation. Photographic film assemblage and apparatus. 3,872,487, Cl. 354-86.000.

Goldenstein, John E., to Philip Morris Incorporated. Conversion of cigarette vending machines to hold outsized cigarette packages. 3,871,059, Cl. 29-427.000.

Goldsmith, Aaron: *See—*
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Goldstein, Norman P.; and Todt, William H., to Westinghouse Electric Corporation. Self-powered neutron detector. 3,872,311, Cl. 250-390.000.

Golovinov, Mikhail Fedotovich: *See—*
Bykov, Alexandr Vasilievich; Kalnin, Igor Martynovich; Krotkov, Vladimir Nikolaevich; Dyachkov, Fedor Nikolaevich; Plokhov, Viktor Ivanovich; Golovinov, Mikhail Fedotovich; Erokhov, Veniamin Kuzmich; and Starostin, Jury Stepanovich, 3,871,407.

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Goodman, Daniel J. Water-cooled flexible riser tube cable terminal. 3,872,232, Cl. 174-19.000.

Goodman, David S., to International Telephone and Telegraph Corporation. Matched impedance printed circuit board connector. 3,871,728, Cl. 339-14.00R.

Goodman, Henry G., Jr.; Dupraz, Carol A.; and Lourigan, George H., to Union Carbide Corporation. Treatment of cellulosic textile fabrics with methylolated alkoxyalkyl carbamates. 3,871,822, Cl. 8-187.000.

Goodyear Tire & Rubber Company, The: *See*—
Enabnit, Robert S., 3,872,424.
Henderson, James Neil; and Shaheen, Frank G., 3,872,071.
Hewitt, John H.; and Johnson, Ernest D., 3,871,514.
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Gossel, Helmut: *See*—
Schaum, Helmut; and Gossel, Helmut, 3,871,971.

Gotoh, Hideyuki. Culturing of pearls. 3,871,333, Cl. 119-4.000.

Gotou, Toshiaki; and Saijo, Ryuichi, to Nippon Electric Company, Limited. N-gate thyristor oscillator having a parallel circuit operable as a constant current circuit when the thyristor is conductive. 3,872,405, Cl. 331-111.000.

Gottesman, Roy T.: *See*—
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Gotz, Walter: *See*—
Anschutz, Erhard; and Gotz, Walter, 3,871,092.

Gournelle, Maurice Paul. Semi-automatic distributor of doses of viscous products. 3,871,558, Cl. 222-181.000.

Grachev, Leonid Pavlovich; Anikanov, Nikolai Ivanovich; Zax, Grigory Iosifovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich. Apparatus for dividing a stream of printed newspapers into portions. 3,871,638, Cl. 270-32.000.

Graf, Hermann: *See*—
Wanka, Oskar; Gutlhuber, Friedrich; and Graf, Hermann, 3,871,445.

Graf, Peter-Josef: *See*—
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Grafinger, Wilhelm, to Siemens Aktiengesellschaft. Method and apparatus for linearizing the characteristic of a sweep frequency generator. 3,872,406, Cl. 331-178.000.

Grammatico, Stephen A. Safety holder for electrically powered hand grinders. 3,871,137, Cl. 51-166.00R.

Grebier, Gerard; and Arlot, Pierre, to Saft-Societe Des Accumulateurs Fixes Et De Traction. Air depolarized cell. 3,871,920, Cl. 136-86.00A.

Greczin, John; and Faigenbaum, Roy D., deceased (by Faigenbaum, Sylvia, executrix). Circular knitting machine. 3,871,194, Cl. 66-9.00A.

Green, Edward Howard; and Green, Edward Howard, Jr. Rotating cylinder internal combustion engine. 3,871,337, Cl. 123-8.470.

Green, Edward Howard, Jr.: *See*—
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Green, Eugene L., to United States of America, Navy. Multidimensional fourier transform optical processor. 3,872,293, Cl. 235-181.000.

Green, Ralph W., to Milaca Mills, Inc. Tennis panty. 3,871,030, Cl. 2-238.000.

Greene, Tweed & Co., Inc.: *See*—
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Greenwald, Carl V.: *See*—
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Greenwald, Lewis E.; and Greenwald, Carl V. Audible emergency warning signal device for an air brake system. 3,872,426, Cl. 340-52.00C.

Greenwood, Robert C., to Pan-Nova, Inc. Gasoline dispenser. 3,871,503, Cl. 194-13.000.

Greer, James E. Continuous liquid treatment of textile materials. 3,871,819, Cl. 8-130.100.

Grenier, George D. Infant carrier. 3,871,562, Cl. 224-6.000.

Gresham, John T., to AMC Corporation. Fluorinated polyurethane stain repellents. 3,872,058, Cl. 260-77.5AM.

Gressard, Charles F.; and Schiff, Charles M., to Teleflex Incorporated. Lever control assembly. 3,871,244, Cl. 74-491.000.

Grieb, Dale Christian, to Black and Decker Manufacturing Company, The. Method of assembling an electric motor device and heat sink. 3,871,069, Cl. 29-596.000.

Griffith, James R.: *See*—
Field, Donald E.; and Griffith, James R., 3,872,045.

Grimshaw, Charles: *See*—
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Grisar, J. Martin; Parker, Roger A.; and Kariya, Takashi, to Richardson-Merrell Inc. Derivatives of 1,3-benzodioxole-2-carboxylic acid. 3,872,105, Cl. 260-340.500.

Gritz, Darrell D., to Jacuzzi Bros. Incorporated. Pump system and valve assembly therefor. 3,871,792, Cl. 417-38.000.

Groomes, Jacqueline. Bingo carrying case. 3,871,519, Cl. 206-223.000.

Grooms, George V., to Animal Fair, Inc. Eye construction for soft stuffed toys. 3,871,128, Cl. 46-165.000.

Groov-Pin Corporation: *See*—
Bosse, Robert W., 3,871,429.

Grose, Ansel B. Fuel control valve. 3,871,403, Cl. 137-436.000.

Gross, Thomas A. O. Electric motor oraking system. 3,872,363, Cl. 318-212.000.

Grosso, Attilio: *See*—
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Grosso, Vincenzo; and Grosso, Attilio. Self-warming container for precooked foods. 3,871,357, Cl. 126-263.000.

Grout, Edward C.; and Klassy, Donald F., to Sta-Rite Industries, Inc. Control unit for a water softener. 3,872,004, Cl. 210-127.000.

Groves, Alexander J.; and Groves, Alexander J., Jr. Electrical elements operable as thermisters, varisters, smoke and moisture detectors, and methods for making the same. 3,872,419, Cl. 338-25.000.

Groves, Alexander J., Jr.: *See*—
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GTE Laboratories Incorporated: *See*—
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Gutowski, Antoni Pawel; and De Jong, Maarten Cornelis, to Stanley Works, The. Level vial assembly. 3,871,110, Cl. 33-379.000.

Gutzwiller, Juerg Albert Walter; and Uskokovic, Milan Radoje, to Hoffman-La Roche Inc. Processes and intermediates for quinine, quinidine, isomers and derivatives thereof. 3,872,129, Cl. 260-288.00R.

Guy, Kenneth Ronald; and Hood, Robert Burns, to Rolls-Royce (1971) Limited. Blade for fluid flow machines. 3,871,791, Cl. 416-193.000.

Guzman, Angel; and Marx, Michael, to Syntex (U.S.A.) Inc. New photochemical process for producing 9-oxygenated-11α-hydroxymethyl-15α-hydroxyprosta-5-cis,13-trans-dienoic acids. 3,871,979, Cl. 204-158.00R.

Haag-Streit AG: *See*—
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Haas, Werner E. L.; Adams, James E.; and Mechlowitz, Bela, to Xerox Corporation. Method for providing a liquid crystalline film. 3,871,904, Cl. 117-72.000.

Habdo, Robert T.; and Burger, William P., to Buffalo Forge Company. Fan construction. 3,871,795, Cl. 417-360.000.

Habermeier, Juergen; Baumann, Dieter; Porret, Daniel; and Batzer, Hans, to Ciba-Geigy AG. Binuclear N-heterocyclic N,N-diglycidyl compounds, processes for their manufacture and their use. 3,872,097, Cl. 260-309.500.

Habinger, Max, to Hygro Dynamics Industries, Inc. Easily changeable filter holder. 3,871,752, Cl. 350-318.000.

Hadermann, Albert F.; Waters, Paul F.; and Woo, Jung Woo. Electroosmotic osmometer. 3,871,990, Cl. 204-301.000.

Hadi, Homayoun: *See*—
Jamison, Will B.; Burr, John F.; and Hadi, Homayoun, 3,871,302.

Haede, Werner: *See*—
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Haerter, Manfred: *See*—
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Hagenlocher, Arno K., to GTE Laboratories Incorporated. Electron emission from a cold cathode. 3,872,489, Cl. 357-15.000.

Hager, James R., to Brunswick Corporation. RFI suppression spark plug. 3,871,349, Cl. 123-169.0EL.

Hagi, Kurt: *See*—
Papritz, Hans; and Hagi, Kurt, 3,871,753.

Hahn, Russell J. High speed food measuring and/or forming machine. 3,871,085, Cl. 17-32.000.

Hajdu, Juan: *See*—
Fadgen, Earl J., Jr.; and Hajdu, Juan, 3,871,889.

Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polymerization catalyst. 3,872,177, Cl. 260-665.00R.

Halasa, Adel Farhan, to Firestone Tire & Rubber Company, The. New hydrogenation catalyst for elastomers, and the process of hydrogenation. 3,872,072, Cl. 260-94.70H.

Halcon International, Inc.: *See*—
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Halliburton Company: *See*—
Dial, Darrell D.; and von Bose, Robert J., 3,871,529.

Hallock, Robert L. Driven fastener for limited penetration of metal. 3,871,264, Cl. 85-30.000.

Halvorsen, Robert M., to Ex-Cell-O Corporation. Method of joining a fuel spray nozzle to a fuel manifold. 3,871,063, Cl. 29-470.500.

Hamada, Kenzo; Uchiyama, Hiroshi; Sugi, Jiro; and Kamada, Osamu, to E. C. Chemical Industries & Co., Ltd.; and Mitsubishi Chemical Indsutries Ltd. Liquid flocculant comprising condensation product of aromatic aldehyde and polyol. 3,872,000, Cl. 210-54.000.

Hamman, Lyle J., to Eaton Stamping Company. Recoil starter. 3,871,350, Cl. 123-185.00A.

Hammann, Ingeborg: *See*—
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Hammer, Ilse M. Disposable nursing container. 3,871,542, Cl. 215-11.00E.

Hammer, James R.: *See*—
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Hamprecht, Gerhard; Koenig, Karl-Heinz; and Bolz, Gerhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of o-sulfamidobenzoic acids. 3,872,167, Cl. 260-518.00R.

Hamy, Norbert, to Trebron Holdings Ltd. Constant module system. 3,871,146, Cl. 52-79.000.

Hance, Allen P. Security screen for window. 3,871,434, Cl. 160-91.000.

Hand, William C., to Luxo Lamp Corporation. Carton for lamp and the combination thereof. 3,871,520, Cl. 206-320.000.

Handforth, John Anthony: *See*—
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Haney, Thomas Albert; Bruno, Gerald Anthony; and Bartlett, Janeth, to E. R. Squibb & Sons, Inc. Tc–99m albumin aggregates with stannous tin and denatured albumin. 3,872,226, Cl. 424-1.000.

Hanneman, Charles K., to King Radio Corporation. Method and apparatus for decreasing channel spacing in digital frequency synthesizers. 3,872,397, Cl. 331-1.00A.

Hanson, John W.; and MacDougall, John D., to Sprague Electric Company. Asymmetrical dual-gate FET. 3,872,491, Cl. 357-23.000.

Hanyu, Susumu, to Janome Sewing Machine Co. Zig-zag sewing machine. 3,871,310, Cl. 112-158.00F.

Harada, Kenichi, to Olympus Optical Company Limited. Lens system having magnification ×1. 3,871,749, Cl. 350-215.000.

Hardy, William C.; Schultze, Edward F.; and Shepard, John C., to Sun Oil Company (Delaware). Method of formation consolidation. 3,871,455, Cl. 166-288.000.

Harke, Cyril J.; and Crippen, Monte D., to Hooker Chemicals & Plastics Corporation. Cathode structure for electrolytic cell. 3,871,988, Cl. 204-284.000.

Harper, John D.; Breyer, Frederick; and Wagner, Richard C., to Integral Process Systems, Inc. Method and apparatus for flash freezing various products. 3,871,185, Cl. 62-63.000.

Harper, John D.; Breyer, Frederick; and Wagner, Richard, to Integral Process Systems, Inc. Method and apparatus for flash freezing various products. 3,871,190, Cl. 62-380.000.

Harper, Robert J., Jr.; Bruno, Joseph S.; Blanchard, Eugene J.; and Gautreaux, Gloria A., to United States of America, Agriculture. Simultaneous dyeing and crosslinking of cellulosic fabrics. 3,871,817, Cl. 8-17.000.

Harris-Intertype Corporation: *See*—
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Harris, Nicholas D., to Morton-Norwich Products, Inc. Process for preparing chloromethylated polystyrene-divinylbenzene copolymer. 3,872,067, Cl. 260-80.780.

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Lowry, Robert D.; and Harrison, John W., 3,872,194.

Harrison, Kenneth S., to Mohasco Industries, Inc. Chair with projecting headrest and hardware therefor. 3,871,705, Cl. 297-61.000.

Harrison, William M. Water flood process in clay-bearing subsurface formations. 3,871,454, Cl. 166-275.000.

Hartmann, Gerhard: *See*—
Schmidt, Peter; Kizler, Harald; and Hartmann, Gerhard, 3,871,338.

Haseba, Shigeru, to Kobe Steel Ltd. Method for removing harmful components from exhaust gases. 3,872,213, Cl. 423-213.700.

Hasegawa, Tsuneo; and Nakahara, Kiyoharu. Apparatus for removing acid gas from waste gas. 3,871,987, Cl. 204-263.000.

Hasha, Malvern M. Method of externally testing connections between tubular members. 3,871,209, Cl. 73-49.100.

Hashimoto, Hideyuki: *See*—
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Hashimoto, Kinro: *See*—
Todani, Yoshihiro; Sugi, Nagatoshi; and Hashimoto, Kinro, 3,872,036.

Hashimoto, Mitsuru, to Kabushiki Kaisha Ricoh. Electrophotographic photoconductive layer comprising an organic photoconductor and a dicyanomethylene-indenothiophene sensitizer. 3,871,883, Cl. 96-1.500.

Hashimoto, Teiji; Kiyohara, Takehiko; Uchiyama, Takashi; Tsunekawa, Tokuichi; Kakunodate, Masamichi; and Nakamoto, Soichi, to Canon Kabushiki Kaisha. Metering device for a single lens reflex camera. 3,872,484, Cl. 354-59.000.

Hashino, Yasuo; Yoshino, Masatsugu; Sawabu, Hitoshi; and Konno, Tsugio, to Asahi Kasei Kogyo Kabushiki Kaisha. Hollow fibers of acrylonitrile polymers for ultrafilter and method for producing the same. 3,871,950, Cl. 161-178.000.

Hata, Shigeki, to Kanto Seiki Company Limited. Tire pressure detecting switch. 3,872,268, Cl. 200-61.220.

Hatala, Andrew A.: *See*—
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Hatfield, John D., to Owens-Illinois, Inc. Plastic jacket for containers. 3,871,699, Cl. 294-87.200.

Hatkin, Leonard, to United States of America, Army. Shunt loaded line phase shifter. 3,872,409, Cl. 333-31.00R.

Hatmaker, James W. Flashing for pitch pocket. 3,871,145, Cl. 52-60.000.

Hatz, Ernst; and Oertel, Erhard, to Motorenfabrik Hatz KG. Fuel injection pump with improved return flow conduit. 3,871,345, Cl. 123-139.0AF.

Haug, Thomas J. Smoke generator using liquid smoke. 3,871,353, Cl. 126-59.500.

Hauni-Werke Korber & Co., KG: *See*—
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Hawke, Francis Murray: *See*—
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Hawkins, Robert W.: *See*—
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Hayashi, Makoto; and Hinata, Masanori, to Sumitomo Electric Industries, Ltd. Continuous hydrostatic extrusion-drawing apparatus. 3,871,201, Cl. 72-60.000.

Hayashi, Shintaro: *See*—
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Hayashi, Takao; Kato, Hajime; and Ishige, Sadao, to Fuji Photo Film Co., Ltd. Recording sheet. 3,871,900, Cl. 117-36.800.

Hayashi, Takeshi, to Kyoei Zoki Kabushiki Kaisha. Apparatus for sucking up and transferring fishes. 3,871,332, Cl. 119-3.000.

Hayashi, Yasutake: *See*—
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Hazen Research, Inc.: *See*—
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Hazen, Wayne C.; and Coltrinari, Enzo L., to Hazen Research, Inc. Ion exchange process for the recovery of metals. 3,872,209, Cl. 423-24.000.

Heath, Desmond. Model sailing ship. 3,871,127, Cl. 46-93.000.

Heffler, Jochen: *See*—
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Hegenbart, Horst, to Gebr. Hofmann KG. Methods and apparatuses for dynamic axle angle measurement on motor vehicles. 3,871,106, Cl. 33-203.130.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
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Heidenreich, William C.: *See*—
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Heilprin, Laurence B.; Nordquist, George; and Krupen, Philip, to United States of America, Army. Electrostatic proximity fuse. 3,871,296, Cl. 102-70.20P.

Heim Universal Corporation: *See*—
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Heinsohn, Howard H., Jr.: *See*—
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Heitmann, Albert W.: *See*—
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Helf, Larry R. Sample display rack. 3,871,524, Cl. 211-45.000.

Henderson, James Neil; and Shaheen, Frank G., to Goodyear Tire & Rubber Company, The. Polymers of conjugated diene hydrocarbons and method of preparation. 3,872,071, Cl. 260-94.300.

Henkel, Hans-Joachim; De Bucs, Eugen Szabo; and Koch, Christian, to Siemens Aktiengesellschaft. Apparatus for reacting vaporized, gasified or atomized hydrocarbon with a gas serving as an oxygen carrier. 3,871,838, Cl. 48-107.000.

Henley, Virgil E.; and Kovalchik, Steve, Jr., to General Tire & Rubber Company, The. Pneumatic tire carcass building machine having a bead lock assembly and a method of using the same. 3,871,942, Cl. 156-400.000.

Henriksen, Norolf. Incinerator. 3,871,286, Cl. 110-8.00R.

Henry, Donald L. Gas distribution apparatus for artificial logs. 3,871,355, Cl. 126-127.000.

Henson, Rudy D.: *See—*
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Hepp, K. Kevin; and Price, James H., to Owens-Illinois, Inc. Child-resistant closure. 3,871,662, Cl. 215-223.000.

Hercules Incorporated: *See—*
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Herndon, John W., to United States of America, Navy. 360 Degree panoramic television system. 3,872,238, Cl. 178-6.000.

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Heros, Ricardo J., to Richards Manufacturing Company. Myringotomy drain tube. 3,871,380, Cl. 128-350.00R.

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Herrmann, Henry Otto, Jr., to AMP Incorporated. Shielded high voltage connector. 3,871,735, Cl. 339-177.00R.

Herrmann, Manfred: *See—*
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Hertler, Walter Raymond, to du Pont de Nemours, E. I., and Company. Crystalline photo-polymerizable composition. 3,871,885, Cl. 96-35.100.

Hervey, John D.; and Smith, Waymon G., to Ferro Corporation. Thermoplastic screen process inks. 3,872,044, Cl. 260-30.80R.

Herziger, Gerd Bernd: *See—*
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Hesse, Kurt, to Staff KG. Connecting device for current distributor rails. 3,871,730, Cl. 339-21.00R.

Hewett, Colin Leslie; and Savage, David Samuel, to Akzona Incorporated. New 2β, 16β-diamino-androstanes and their preparation. 3,872,091, Cl. 260-239.500.

Hewitt, Graham: *See—*
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Hewitt, John H.; and Johnson, Ernest D., to Goodyear Tire & Rubber Company, The. Safety brake apparatus for belt conveyor. 3,871,514, Cl. 198-232.000.

Heyek, Gerhard, to Famulus Elektrogerate Gesellschaft m.b.H. Cutter foils for dry shaving apparatus. 3,871,080, Cl. 30-346.510.

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Hijiya, Hiromi; and Shiosaka, Makoto, to Hayashibara Biochemical Laboratories, Incorporated. Shaped bodies of pullulan esters and their use. 3,871,892, Cl. 106-126.000.

Hijiya, Hiromi; and Shiosaka, Makoto, to Hayashibara Biochemical Laboratories, Incorporated. Process for the preparation of food containing pullulan and amylose. 3,872,228, Cl. 426-19.000.

Hikida, Ryotara; Hayashi, Yasutake; and Arakawa, Hideo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Automatic brake controlling method and device. 3,871,715, Cl. 303-21.0BE.

Hildebrandt, William J., to Stanley Works, The. Marking gauge. 3,871,100, Cl. 33-42.000.

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Jackson, Richard L., to Jackson Communication Corporation. Cable chute. 3,871,621, Cl. 254-134.3PA.
Jackson, Richard R. Humidifying gas. 3,871,373, Cl. 128-193.000.
Jacob, Jean: *See—*
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Jacobs, Arthur W. Reciprocating screw injection molding machine cylinder head with integral spreader and automatic nozzle. 3,871,805, Cl. 425-245.0NS.
Jacobs, Dennis Y. Fish lure. 3,871,122, Cl. 43-42.270.
Jacuzzi Bros. Incorporated: *See—*
Gritz, Darrell D., 3,871,792.
Jakob, Horst, to Prestil. Method and apparatus for manufacturing slide fastener elements. 3,871,420, Cl. 139-116.000.
Jakubowski, Heinz; and Leutwein, Klaus, to Carl Zeiss-Stiftung, a/k/a Carl Zeiss. Device for automatic exposure control in a surgical microscope or the like. 3,872,303, Cl. 250-214.00P.
James, Robert L., to Bendix Corporation, The. Resolver to DC converter. 3,872,388, Cl. 328-133.000.
Jamison, Will B.; Burr, John F.; and Hadi, Homayoun, to Consolidation Coal Company. Trolley control system. 3,871,302, Cl. 104-153.000.
Jamison, Will B., to Consolidation Coal Company. Method for mining and supporting the mine roof. 3,871,707, Cl. 299-11.000.
Jandourek, Hana. Composition and method for improving adherence of polymeric materials to substrates. 3,872,047, Cl. 260-33.40R.
Janiszewski, Kasimir. Die set bushing retainer. 3,871,226, Cl. 72-456.000.
Janome Sewing Machine Co.: *See—*
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Japan Carboxylic Acids Co., Ltd.: *See—*
Saito, Hideomi; Yamashita, Takashi; Munezawa, Takuro; and Kato, Tetsuya, 3,872,142.
Japanese Geon Co. Ltd., The: *See—*
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Matsui, Kazumi; Umemori, Takashi; Shibata, Yutake; and Yamamura, Kinzo, 3,871,727.
Jarosik, Norman A.; and Weppner, Benjamin H., to Mennen-Greatbatch Electronics, Inc. Waveform and symbol display system. 3,872,461, Cl. 340-324.0AD.
Jay R. Smith Mfg. Co.: *See—*
Weigel, Hugo K., 3,871,034.
Jean Waltersheid GmbH: *See—*
Geisthoff, Hubert, 3,871,463.
Jeffers, Ellis E., to Aspro, Incorporated. Lock-up differential including speed-responsive inhibiting means. 3,871,249, Cl. 74-711.000.
Jefferson Chemical Company, Inc.: *See—*
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Jenkins, Otto L., to Smitty's Easy Tow, a part interest. Device for loading and carrying boats on pickup trucks. 3,871,540, Cl. 214-450.000.
Jenny, Jean Paul Joseph: *See—*
Pierron, Claude Raymond; Jenny, Jean Paul Joseph; and Zuccaro, Robert, 3,871,028.
Jensen, Kenneth D., to Midland-Ross Corporation. Hydraulically operated brake pressure modulator. 3,871,717, Cl. 303-21.0AF.

Jenvey, Leslie R.: *See—*
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Jetsew, Inc.: *See—*
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Jett, Marion B.; and Spriggs, Dennis M., to Dresser Industries, Inc. Dual string circulating valve. 3,871,450, Cl. 166-224.00R.

Jeumont-Schneider: *See—*
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Joh. Friedrich Behrens: *See—*
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Johansson, Roy Ingvar Mendel; and Lagerqvist, Roy S. G., to Volvo Flygmotor Aktiebolag. Device for positively retaining a ball-shaped bearing member in a mating bearing seat. 3,871,782, Cl. 403-122.000.

John, Frederick W. Door and door mounting structure for mounting without fasteners. 3,871,283, Cl. 109-56.000.

John (Huntingdon) Limited: *See—*
Hornby, John Alfred, 3,871,274.

Johns-Manville Corporation: *See—*
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Johnson, Robert William: *See—*
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Johnson, Thomas P.; and van Berkum, Wilmer T. Device for fixation of preparturient vaginal prolapse. 3,871,368, Cl. 128-127.000.

Johnston, Ambrose G.; Howard, Guy W.; and Bradshaw, William W., Jr. Portable apparatus for removing poultry from a poultry house. 3,871,335, Cl. 119-82.000.

Jones, Allen G., to General Electric Company. Safety control for a remote control system. 3,871,443, Cl. 165-11.000.

Jones, Christopher Robin; Williams, Malcolm; and Brunt, Geoffrey Albert Kenyon, to C.A.V. Limited. Square wave transistor relaxation oscillator. 3,872,404, Cl. 331-111.000.

Jones, Cynthia G., to Eastman Kodak Company. Photothermographic composition, element and process. 3,871,887, Cl. 96-67.000.

Jones, Elwyn David; and Scuffell, Derek Edgar, to Canadian Industries Limited. Bag severing machine. 3,871,269, Cl. 93-13.000.

Jones, Gordon H.; Ranganathan, Ramachandran S.; and Moffatt, John G., to Syntex (U.S.A.) Inc. Purine nucleoside 3,5-cyclicphosphate compounds. 3,872,084, Cl. 260-211.50R.

Jones, Gordon H.; and Moffatt, John G., to Syntex (U.S.A.) Inc. 1,N^6-ethenoadenosine cyclophosphate compounds. 3,872,098, Cl. 260-211.50R.

Jones, Harry Joseph: *See—*
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Jones, Richard Alfred: *See—*
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Juby, Peter Frederick; and Hudyma, Thomas William, to Bristol-Myers Company. 11 H-Pyrimido[4,5-b][1,4]benzodiazepines. 3,872,122, Cl. 260-256.40F.

Jumel, Yves: *See—*
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Jureit, John Calvin; Castillo, Adolfo; and Rionda, Carlos. Test stand for trusses. 3,871,213, Cl. 73-94.000.

Jurschak, John J. Signal transmission and surveillance system using a subscriber's telephone line without interfering with normal telephone line operation. 3,872,253, Cl. 179-5.00R.

Juskewicz, Joseph A., Jr., to Lear Siegler, Inc. Furnace control circuit. 3,872,320, Cl. 307-117.000.

K-P Manufacturing Co., Inc.: *See—*
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Kaburaki, Yasuo; and Kobayashi, Kiyoshi, to Hiroshi Hukuba. Floor cleaner. 3,871,047, Cl. 15-42.000.

Kabusai Denshin Denwa Kabushiki Kaisha: *See—*
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Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
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Kabushiki Kaisha Toyota Cluo Kenkyusho: *See—*
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Kachalova, Revekka Vulfovna; Nemtsov, Mark Semenovich; and Balkhanova, Galina Fedorovna. Method for producing phosphate catalyst. 3,872,216, Cl. 423-313.000.

Kagari, Yoshiharu; and Hirokawa, Koichi, to Kabushiki Kaisha Ricoh. Duplicator master feed using decimal code to set copy count. 3,871,294, Cl. 101-132.500.

Kageyama, Katsuhiro; and Utsunomiya, Shinhachi, to Tokyo Shibaura Electric Company, Ltd. Cold cathode ionization gauge. 3,872,377, Cl. 324-33.000.

Kahling, Joachin: *See—*
Rieper, Helmut; Kruger, Gerd; Keck, Johannes; Noll, Klaus-Reinhold; and Kahling, Joachin, 3,872,090.

Kahn, Henry, to KG Company. Method for cleaning cavities with a combined fluid delivering and aspirating instrument. 3,871,099, Cl. 32-40.00R.

Kaiser, Robert H.: *See—*
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Kakunodate, Masamichi: *See—*
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Kalenevitch, Barry R. Ignition timing device and method. 3,872,376, Cl. 324-17.000.

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Kallenborn, John, to PPG Industries, Inc. Apparatus for winding glass strands. 3,871,592, Cl. 242-18.00G.

Kalnin, Igor Martynovich: *See—*
Bykov, Alexandr Vasilievich; Kalnin, Igor Martynovich; Krotkov, Vladimir Nikolaevich; Dyachkov, Fedor Nikolaevich; Plokhov, Viktor Ivanovich; Golovinov, Mikhail Fedotovich; Erokhov, Veniamin Kuzmich; and Starostin, Jury Stepanovich, 3,871,407.

Kalogerson, Thomas A.; and Dandois, Joseph E., to Optimizer Control Corporation. Speed controlled ignition retarder. 3,871,341, Cl. 123-117.00R.

Kamada, Isao: *See—*
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Kamen, Dean L. Control device for a monitor supervising a patient. 3,871,361, Cl. 128-2.05R.

Kaminow, Ivan Paul; and Kogelnik, Herwig Werner, to Bell Telephone Laboratories, Incorporated. Composite thin film optical device. 3,871,742, Cl. 350-96.0WG.

Kanda, Kenzi: *See—*
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Kanda, Masao; and Watanabe, Akio, to Fuji Photo Film Co., Ltd. Coating material recovering device for air knife type coating apparatus. 3,871,326, Cl. 118-63.000.

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Kaneko, Takashi: *See—*
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Kanemaru, Toyonosuke; Shimada, Toshio; and Inudow, Isao, to Nippon Carbon Co. Ltd. Process for the preparation of graphite fluoride. 3,872,032, Cl. 260-2.00H.

Kanengieter, Glenn G.; and Peterson, Daniel E., to Owatonna Manufacturing Company, Inc. Stack former and compacting structure. 3,871,163, Cl. 56-344.000.

Kansai Paint Company Limited: *See—*
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Karas, Wolfgang, to Forschungsinstitut fur Orthopadie-Technik. Artificial hydraulic ankle joint. 3,871,032, Cl. 3-1.200.

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Karl M. Reich Maschinenfabrik: *See—*
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Kataoka, Hiroshi, to Kataoka Machine Product Co., Ltd. Winding tension control system. 3,871,598, Cl. 242-75.510.

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Kathawala, Faizulla G., to Sandoz-Wander, Inc. 1-Substituted-5,6-dihydro-pyrrolo(3,2,1-ij)quinazolin-3(3H)-ones. 3,872,119, Cl. 260-251.00A.

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Kato, Tetsuji; Tamai, Katsumi; Kamada, Isao; Kichiji, Hiroshi; Nakai, Yoshio; Kitahara, Haruyoshi; Iwaoka, Yasuhiko; Okajima, Kiyonori; and Ueno, Tadaomi, to Mitsubishi Rayon Co. Ltd. Process and an apparatus for continuously casting a sheet and the like. 3,872,197, Cl. 264-40.000.

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Kaufman, Martin H.; and Roy, Edward M., to United States of America, Navy. Wet process for compounding polymer-solids compositions. 3,872,192, Cl. 264-3.00B.

Kautz, Robert F.; Bourgeault, Leo B.; and Eckenfelder, Robert C., to Bendix Corporation, The. DV/DT circuit for use in D.C. link converters. 3,872,372, Cl. 321-45.00C.

Kawai, Sadaharu: *See—*
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Kawakami, Hideaki: *See—*
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Kawamoto, Yasushige: *See—*
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Kazuma, Adachi, to Kabushiki Kaisha Daikin Seisakusho. Device for preventing improper disengagement of multiple-disc clutch. 3,871,499, Cl. 192-70.290.

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Keck, Max H., to Goodyear Tire & Rubber Company, The. Copolyester resin containing anion attractive groups. 3,872,183, Cl. 260-860.000.

Keenan, Bernard J., Jr., to Sun Oil Company of Pennsylvania. Laser beam drill. 3,871,485, Cl. 175-16.000.

Kehr, Clifton L.; and Wszolek, Walter R. Polyene carbamates. 3,872,150, Cl. 260-468.00E.

Kehr, Clifton L.; and Wszolek, Walter R. Polyene carbamates. 3,872,151, Cl. 260-471.00C.

Kehr, Clifton L.; and Wszolek, Walter R. Terminally unsaturated liquid polyene having internally unreactive carbon-to-carbon unsaturation. 3,872,152, Cl. 260-471.00C.

Keijzer, Johan H.; Jossa, Louis J.; Renders, Herman E. A.; and Oancea, Alexandru, to Monroe Belgium N.V. Vehicle leveling system. 3,871,679, Cl. 280-124.00F.

Keith, James Duncan, to Rockwell International Corporation. Motor control circuit. 3,872,366, Cl. 318-331.000.

Keith, W. Gill; and Ferris, F. Donald, to General Electric Company. Calciner with baffle means. 3,871,829, Cl. 23-279.000.

Kellert, Paul H. Cement spray gun with remote air injection. 3,871,583, Cl. 239-302.000.

Kelly, Wilfred H., Jr. Lift truck mast. 3,871,494, Cl. 187-95.000.

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King, Arthur S. Apparatus for flocculation of dissolved substances. 3,871,989, Cl. 204-299.000.

King, James D.: *See—*
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King, John O., Jr. Break-off tool. 3,871,563, Cl. 225-103.000.

King, John P., to ESL Incorporated. Direction finding techniques employing electronic phase modulation. 3,872,477, Cl. 343-120.000.

King, Lawrence F.; Gaspar, Noel J.; and Pasternak, Israel S. Visbreaking a heavy hydrocarbon feedstock in a regenerable molten medium. 3,871,992, Cl. 208-125.000.

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Kinney, James F.; and Gadzala, Antoni Edward, to Avon Products, Inc. Promoting color change in human hair with a dialdehyde compound and a nitrogen containing compound. 3,871,818, Cl. 8-10.200.

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Klein, Keith William; Swetnam, Norman Thomas; and Cahill, Robert Allen, to General Electric Company. Fire detection and projection circuit and device. 3,872,355, Cl. 317-18.00D.

Klevecz, Robert R. Process for automated production of synchronous mammalian cells. 3,871,955, Cl. 195-1.800.

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Koch, Dieter; and Graf, Peter-Josef, to Blaupunkt-Werke GmbH. Rotary potentiometer. 3,872,420, Cl. 338-162.000.

Koch, Werner, to Sandoz Ltd. Coumarinimides. 3,872,106, Cl. 260-343.20R.

Kochanny, Gerald L., Jr.; and Chamberlin, Thomas A., to Dow Chemical Company, The. Preparation of 1,1,1-trichloroethane. 3,872,176, Cl. 260-658.00R.

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Koehring Company: *See*—
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Koeman, Henriecus, to U. S. Philips Corporation. Method of, and apparatus for, determining radiation energy distributions. 3,872,287, Cl. 235-151.310.

Koenig, Elmer A.; Conklin, Robert M.; Bessinger, Walter L.; and Russell, Jack A., to Sherwood Medical Industries Inc. Pelletized medicament dispensing system. 3,871,156, Cl. 53-59.00R.

Koenig, Karl-Heinz: *See*—
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Koenig, Robert W. Folding truck bumper. 3,871,695, Cl. 293-73.000.

Koenig, Wolfgang; Geiger, Rolf; and Wissmann, Hans, to Farbwerke Hoechst Aktiengesellschaft. Method for the animalysis of activated esters in the presence of N-hydroxy compounds as catalysts. 3,872,074, Cl. 260-112.500.

Koerber, Marvin A., to Automation Industries, Inc. Thermoplastic film. 3,872,041, Cl. 260-23.0XA.

Koga, Issac; Kobayashi, Shigeo; and Okamoto, Isao, to Kabusai Denshin Denwa Kabushiki Kaisha. Fixture for measuring parameters of quartz crystal units. 3,872,385, Cl. 324-56.000.

Koga, Ryosuke; and Nonome, Kazuhiro, to Kayabakogyokabushikikaisha. Hydraulic cylinder assembly for telescopic boom. 3,871,265, Cl 91-189.000.

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Koike, Hirotami, to Nihon Denshi Kabushiki Kaisha. Convertible scanning electron microscope. 3,872,305, Cl. 250-311.000.

Kolb, William A.; and Papinchak, Michael J., to United States Steel Corporation. Method and apparatus for controlling the injection of flux into a steelmaking vessel as a function of pressure differential. 3,871,633, Cl. 266-35.000.

Koller, Stefan; Zink, Rudolf; Reichel, Dieter; and Voltz, Jacques, to Ciba-Geigy AG. Process for the manufacture of signal dyes of the cationic series. 3,872,132, Cl. 260-296.00B.

Kolm, Henry H.; and Thornton, Richard D., to Massachusetts Institute of Technology. Stabilization and ride control of suspended vehicles propelled by a linear motor. 3,871,301, Cl. 104-148.0SS.

Kolodziej, Edward. Visual ground fault indicator. 3,872,383, Cl. 324-51.000.

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Krieg, John W.; Gaudio, Alfred; and Borek, Victor F. Band type electric heaters. 3,872,281, Cl. 219-535.000.

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Krishna, Surinder; and Malmberg, Paul R., to Westinghouse Electric Corporation. Bidirectional semiconductor switch with improved dV/dt capability. 3,872,326, Cl. 307-252.00T.

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Kuriyama, Sigeru; and Hashimoto, Hideyuki, to Hitachi Ltd. Electric car controlling device. 3,872,367, Cl. 318-373.000.
Kuster, Jurgen; and Schlosser, Hermann, to Seitz-Werke GmbH. Device for controlling the working speed of bottle treating machines, preferably filling machines in bottle treating installations. 3,871,509, Cl. 198-37.000.
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Jakubowski, Heinz; and Leutwein, Klaus, 3,872,303.
Lever Brothers Company: *See—*
Rijnten, Hendrik Theodorus; and Eikema, Eduard Theodoor Jasper, 3,872,028.
Levine, Arnold M., to International Telephone and Telegraph Corporation. Airport ground surveillance system. 3,872,474, Cl. 343-5.0LS.
Leybold-Heraeus-Verwaltung GmbH: *See—*
Wanetzky, Erwin; and Kuklok, Gerhard, 3,871,630.
Lhermet, Yves J., to Societe Anonyme Sabatier S.A. Machine for assembling a pivotable handle with a package. 3,871,423, Cl. 140-93.00B.
Licentia Patent-Verwaltungs G.m.b.H.: *See—*
Bohm, Harald; and Heffler, Jochen, 3,871,922.
Glausecker, Karl; and Gnutzmann, Uwe, 3,872,400.
Queiser, Horst; Schwarz, Horst; and Schroter, Hans-Jurgen, 3,871,841.
Queiser, Horst; and Schwarz, Horst, 3,871,842.
Licitis, Gunars, to Marvin Glass & Associates. Coordinated visual and audio reproducing apparatus. 3,871,112, Cl. 35-8.00A.
Licitis, Gunars: *See—*
Glass, Marvin I.; and Licitis, Gunars, 3,871,757.
Lidkea, Harrison B.: *See—*
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Lin, Jeunn-Wen; and Lin, Go-Sing. Electric appliance with hair dryer and shaver. 3,872,336, Cl. 310-78.000.
Lindblad, Stig Martin. Vehicle safety belt with inertia responsive brake. 3,871,600, Cl. 242-107.400.
Lindeman, Richard Jay, to Illinois Tool Works Inc. Spring fastener. 3,871,152, Cl. 52-543.000.
Lindeman, Richard Jay: *See—*
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Lindsay Specialty Products Limited: *See—*
Reilly, James Park, 3,872,408.
Linn, Donald F.; and Wishart, George L., to Lipe-Rollway Corporation. Self-adjusting release mechanism for friction clutches. 3,871,500, Cl. 192-111.00A.
Linstromberg, William J., to Whirlpool Corporation. Simplified drive mechanism for ice maker. 3,871,242, Cl. 74-421.00A.
Lipe-Rollway Corporation: *See—*
Linn, Donald F.; and Wishart, George L., 3,871,500.
Lipha, Lyonnaise Industrielle Pharmaceutique: *See—*
Szarvasi, Etienne, 3,872,112.
Lister, Paul M. Braking system for vehicles having speed controlled proportional braking for front and rear wheels. 3,871,713, Cl. 303-6.00C.
Little, Little J.; and Oddo, Joseph A., to United States of America, Army. Fluid flow measuring sensor. 3,872,304, Cl. 250-231.00R.
Litton Medical Products, Inc.: *See—*
Cooley, Austin G., 3,872,242.
Livingston, William L., to Factory Mutual Research Corporation. Fluid control device and a fire protection system incorporating said device. 3,871,457, Cl. 169-20.000.
Lohaus, Gerhard: *See—*
Furrer, Harald; and Lohaus, Gerhard, 3,872,109.
Long, Donald V., to Dalpak Corporation, The. Method of manufacturing compacter bags. 3,871,271, Cl. 93-35.0VL.
Long, John B.; and Stricklin, John B., Jr., to Marmon Group, Inc., The. Rock duster. 3,871,588, Cl. 239-673.000.
Long, John R. Copy machine record system for cost control. 3,872,282, Cl. 235-925.00B.
Long, Terence, to Hudswell Yates Developments Limited. Mole plough linkages. 3,871,781, Cl. 403-121.000.
Longyear Company: *See—*
Cooper, Jamshed Rustom; and Svendsen, Walter W., 3,871,487.
Loofbourrow, Robert J., to Texaco Inc. Seismic playback/monitor system. 3,872,465, Cl. 340-34~.0DA.
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Barton, Derek Harold Richard; Underwood, William George Elphinstone; Looker, Brian Edgar; Hewitt, Graham; and Taylor, Michael Victor, 3,872,086.
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Lord, Henry A., to Diamond International Corporation. Apparatus and method for forming molded fiber products with deckle-free windows. 3,871,586, Cl. 239-569.000.

Lorenz, Horst, to Th. Kieserling & Albrecht. Metal rolling apparatus with exchangeable rolls. 3,871,222, Cl. 72-238.000.

Lorenz, Marilyn J.; and Larson, Michael B. Multilevel chess or checker board. 3,871,657, Cl. 273-131.0AD.

Lorenz, Walter; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O-(n-alkoxy-benzimidoyl)-(thiono)-phosphoric (phosphonic) acid esters. 3,872,185, Cl. 260-944.000.

Lotsch, Wolfgang: *See—*
Dimroth, Peter; Redeker, Joerg; and Lotsch, Wolfgang, 3,872,077.

Loubier, Robert J. Integral rotor and gear assembly. 3,872,334, Cl. 310-43.000.

Loughran, Eugene F., Jr. Magnetically actuated indicator. 3,872,469, Cl. 340-373.000.

Louis, Claude Camille, to Agence Nationale de Valorisation de la Recherche (Anvar). Method and apparatus for determining the permeability characteristics of a porous or fissured medium. 3,871,218, Cl. 73-155.000.

Lourigan, George H.: *See—*
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Louvel, Bernard: *See—*
Andral, Guillaume; Carmassi, Michel; Louvel, Bernard; Maurice, Jacques; and Vandesande, Georges, 3,871,831.

Lowrance, Byron R.; and Mangham, Jesse Roger, to Ethyl Corporation. Process for the production of beryllium hydride. 3,872,224, Cl. 423-645.000.

Lowry, Robert D.; and Harrison, John W., to W. R. Grace & Co. Process for producing a bulk cushioning material. 3,872,194, Cl. 264-22.000.

Lucas, Victor Grifols, to Laboratories Grifols S/A. Method and apparatus for concentrating thermo-labile fluids. 3,871,574, Cl. 233-11.000.

Luckcuck, Robert C. Power lawn mower vacuum attachment. 3,871,052, Cl. 15-328.000.

Lucole, Spencer W., to Nitro-Nobel A.B. Three dimensional seismograph. 3,872,478, Cl. 346-7.000.

Ludwig, David P.: *See—*
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Luhowy, Gabriel J. Test device. 3,872,386, Cl. 324-98.000.

Lund, Jerome E., to Arctic Enterprises, Inc., Snowmobile ski. 3,871,675, Cl. 280-28.000.

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Luxo Lamp Corporation: *See—*
Hand, William C., 3,871,520.

Lyons, Ellis E.; and Turner, William F., to Anderson Electric Corporation. Elbow connector puller. 3,871,056, Cl. 29-283.000.

Lyons, Leo J. Sewer connection. 3,871,401, Cl. 137-381.000.

Mabrouk, Saied Abd-Elrahman, to Addressograph-Multigraph Corporation. Electrophotographic flash system. 3,871,761, Cl. 355-11.000.

MacDougall, John D.: *See—*
Hanson, John W.; and MacDougall, John D., 3,872,491.

Machida, Minoru: *See—*
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Mack, Walter Edward, to McCord Corporation. Pump assembly. 3,871,796, Cl. 417-423.000.

MacKenzie, Gordon C.: *See—*
Hopson, James E.; and MacKenzie, Gordon C., 3,872,308.

MacLeod, Alastair Cameron, to Polysar Limited-Polysar Limitee. Improved carboxylic latex for paper coating utilizing butadiene-styrene-acrylic acid-acrolein tetrapolymers. 3,872,037, Cl. 260-8.000.

Macri, Salvatore: *See—*
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Maddox, Larry A.: *See—*
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Madsen, Rud Erik, to Aktieselskabet De Danske Sukkerfabrikker. Apparatus for separating fluids into two fractions by means of semipermeable membranes. 3,872,015, Cl. 210-346.000.

Maeshima, Haruko: *See—*
Chibata, Ichiro; Yamada, Shigeki; Wada, Mitsuru; Maeshima, Haruko; and Izuo, Nobuhiko, 3,871,959.

Magee, Robert L. Cutting guide and board assembly. 3,871,079, Cl. 30-294.000.

Magne, Frank C.: *See—*
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Mahaffy, Dwight A.: *See—*
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Maire, Pierre-Andre; and Portmann, Hubert, to Compagnie des Montres Longines Francillon S.A. Electronic circuit for correction of the time display on an electronic timepiece. 3,871,168, Cl. 58-23.00R.

Majima, Keiichiro. Pile driver. 3,871,617, Cl. 254-29.00R.

Makhlouf, Joseph M.: *See—*
Mollohan, Kenneth L.; and Makhlouf, Joseph M., 3,872,040.

Maki, Naoki; Okuda, Hironori; Kawai, Sadaharu; and Tatsumi, Tamotsu, to Hitachi, Ltd. Linear synchronous motor for high-speed vehicles. 3,872,357, Cl. 318-135.000.

Malasnicki, Wladyslaw Longin: *See—*
Boboli, Fdyta; Malasnicki, Wladyslaw Longin; Kowalski, Mieczyslaw; and Pazgan, Andrzej, 3,872,143.

Malchman, Franklin Leonard; Johnson, Robert William; and Raddi, William J., to ESB Incorporated. Apparatus for monitoring electrical signals, either artificial and/or natural in a living body, via a communication link. 3,872,252, Cl. 197-2.00A.

Malen, Charles; Desnos, Monique; and Poignani, Jean-Claude, to Societe en nom collectif Science Union et Cie, Societe Francais de Recherche Medicale. Tricyclic compounds of aliphatic w-amino alcohols. 3,872,102, Cl. 260-327.00B.

Malmberg, Paul R.: *See—*
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Maloney, Thomas C., to Burroughs Corporation. Multi-position character display panel. 3,872,339, Cl. 313-188.000.

Mangham, Jesse Roger: *See—*
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Manly, Frank W., Jr., to Lawrence Peska Associates, Inc., a part interest. Inflatable housing for an electricity consuming device. 3,872,235, Cl. 174-52.00R.

Mann, Alfred E., to Pacesetter Systems, Inc. Heart stimulator system for rapid implantation and removal with improved integrity. 3,871,382, Cl. 128-419.00P.

Mann, August C.: *See—*
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Manos, George; DeLuca, Paul V.; Santulli, Vincent F.; and Carney, William V., to Porta Systems Corp. Trunk transition system. 3,872,259, Cl. 179-16.00R.

Manowitz, Milton; Walter, Goerge R.; and Foris, Stephen, Jr., to Givaudan Corporation. Preservatives for aqueous systems. 3,871,860, Cl. 71-67.000.

Marasco, Carmelo, to Ernesto Lendaro. Apparatus for harvesting fruit from trees. 3,871,040, Cl. 56-328.00R.

Marchand, Pierre: *See—*
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Marcus, Henry J., to United States of America, Navy. Oxalacetic acid bis(2-substituted-2,2-dinitroethyl)esters. 3,872,158, Cl. 260-483.000.

Marcus, Henry J., to United States of America, Navy. 2-Substituted-2,2-dinitroethoxy-fumaric acid bis(2-substituted-2,2-dinitroethyl)ester. 3,872,159, Cl. 260-484.00P.

Mariaux, Sady; and Golay, Roland, to J. Bobst & Fils S.A. Sheet feeding assembly. 3,871,642, Cl. 271-138.000.

Marin, Gilbert Joseph: *See—*
Breysse, Jacques; Marin, Gilbert Joseph; and Lefort, Marcel, 3,872,145.

Marin, Glenn R., to Carborundum Company, The. Resurfacing brake discs. 3,871,934, Cl. 156-94.000.

Maringer, Robert E.; and Mobley, Carroll E., to Battelle Development Corporation. Method of making filament of small cross section. 3,871,439, Cl. 164-87.000.

Marmon Group, Inc., The: *See—*
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Marsack, Warren S. Towel rack for use on beaches. 3,871,526, Cl. 211-178.000.

Marshall, Arthur R., to Chemix Corporation. Chemical mixer. 3,871,627, Cl. 259-64.000.

Marshall-Fowler Limited: *See—*
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Martin, Henry; Rohr, Otto; and Pissiotas, Georg, to Ciba-Geigy AG. Propargyl ethers compositions containing them and a method of combating soil fungi. 3,872,104, Cl. 424-340.000.

Martin, John, to Fabricacion de Maquinas. Gob selectors with closed loop servo system. 3,871,858, Cl. 65-304.000.

Martin, Lionel C.: *See—*
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Martin, Milton: *See—*
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Marx, Gerhard; and Kramer, Gunter, to Kalle Aktiengesellschaft. Sheet feeding device. 3,871,641, Cl. 271-42.000.

Marx, Michael: *See—*
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Masaki, Kenji; and Nambu, Shuya, to Nissan Motor Company, Limited. Electronic engine intake air flow measuring device. 3,871,214, Cl. 73-116.000.

Massachusetts Institute of Technology: *See—*
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Master Fence Fittings Inc.: *See—*
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Masuda, Senichi. Electrodynamic apparatus for controlling flow of particulate material. 3,872,361, Cl. 317-262.00E.

Masuda, Yasutoshi: *See—*
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Masumoto, Hakaru; Murakami, Yuetsu; and Hinai, Masakatsu, to Foundation: The Research Institute of Electric and Magnetic Alloys, The. Process for producing a high-permeability alloy for magnetic recording-reproducing heads. 3,871,927, Cl. 148-121.000.

Mathias, Christopher Neil, to Girling Limited. Shoe drum brakes. 3,871,493, Cl. 188-78.000.

Matsubara, Itsuo; and Sakaguchi, Mitsuhito, to Nippon Telegraph & Telephone Public Corporation; and Nippon Electric Company Limited. Binary code conversion to produce binary holograms with enhanced diffraction efficiency. 3,871,740, Cl. 350-3.500.

Matsudaira, Tadashi; and Namiki, Minoru, to Kansai Paint Company Limited. Precoated metal sheets and manufacture thereof. 3,871,896, Cl. 117-6.000.

Matsue, Shigeki, to Nippon Electric Company, Ltd. Inverter circuit employing field effect transistors. 3,872,321, Cl. 307-205.000.

Matsui, Kazumi; Umemori, Takashi; Shibata, Yutake; and Yamamura, Kinzo, to Japanese National Railways; and Sumitomo Electric Industries, Ltd. Current collecting roller. 3,871,727, Cl. 339-8.00R.

Matsui, Shunji: *See—*
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Matsumoto, Shoichi; and Kurematsu, Kazuhiko, to Tokyo Shibaura Electric Co., Ltd. Photoconductive complex with hydroxynitrobenzoic acids and triarylmethane dyes. 3,871,884, Cl. 96-1.600.

Matsunaga, Hirotsugu, to Hanegafuchi Boseki Kabushiki Kaisha. Apparatus for continuously printing yarns with splashed pattern of random pitches. 3,871,196, Cl. 68-203.000.

Matsushima, Yoshiichi; and Abe, Toshiyuki, to Tokyo Shibaura Electric Co. Degaussing device for colour cathode ray tubes. 3,872,347, Cl. 315-8.000.

Matsushita Electric Industrial Company: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Matthews, R. Hurley: *See—*
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Maurer, Robert A., III. Bicycle travel simulator. 3,871,648, Cl. 272-73.000.

Maurice, Jacques: *See—*
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Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See—*
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Maxwell, James D.: *See—*
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Mayer, Simon E., to Avant Incorporated. Laminated identification card. 3,871,119, Cl. 40-2.200.

Mayers, Bernard J.: *See—*
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Mays, Steven L.: *See—*
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McCargar, Joseph V.: *See—*
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McCarthy, Jeremiah P.: *See—*
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McCloskey, Albert R., to Heim Universal Corporation. Anti-friction ball bearing assembly. 3,871,722, Cl. 308-6.00C.

McConnell, Eric Douglas; and Whitehouse, Joseph Colin, to Rank Organisation Limited, The. Television picture correction. 3,872,499, Cl. 358-51.000.

McCord Corporation: *See—*
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McDonald, Lee E. Tongue-thrust correction appliance. 3,871,370, Cl. 128-136.000.

McDonnell Douglas Corporation: *See—*
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McFarland, Philip J.: *See—*
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McKenna, Ronald F., to United States of America, Navy. Constant chamber pressure throttling injector. 3,871,173, Cl. 60-258.000.

McKindree, Delbert R. Connection rod bearing for internal combustion engines. 3,871,245, Cl. 74-579.00E.

McKinney, Daniel F.: *See—*
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McKnight, Audrey M. Cleaning composition. 3,872,021, Cl. 252-121.000.

McMullin, Paul G.: *See—*
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McNaney, Joseph T. Light optic data handling system. 3,872,451, Cl. 340-173.0LM.

McNary, Kenneth Rogers: *See—*
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McNeill, Robert M., to Eldex Laboratories, Incorporated. Fraction collecting apparatus. 3,871,426, Cl. 141-130.000.

McPherson, Donald F., to Tapecon, Inc. Drive for a linear play adapter for a cassette tape recorder. 3,872,501, Cl. 360-2.000.

Mead Johnson & Company: *See—*
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Mechlowitz, Bela: *See—*
Haas, Werner E. L.; Adams, James E.; and Mechlowitz, Bela, 3,871,904.

Mecklenborg, Richard A., to Singer Company, The. Focusing roll and displacement prisms. 3,871,750, Cl. 350-286.000.

Medalert Corporation: *See—*
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Melandri, Rino, to Diemme S.N.C. Intensive wine-making process and the relative plant for carrying it out. 3,871,272, Cl. 99-276.000.

Melde, Chris R. Cooling system for a dental handpiece. 3,871,097, Cl. 32-27.000.

Melgaard, Hans; and Plapp, Nile E., to Despatch Industries, Inc. Monitoring apparatus. 3,872,473, Cl. 340-415.000.

Menck, Bernd-Heinrich: *See—*
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Menke, James A.; and Witherow, Robert G., to G. T. Schjeldahl Company. Fin attachment for tethered balloon structures. 3,871,603, Cl. 244-125.000.

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Mentz, Bernardus J.: *See—*
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Merianos, John J.; and Adams, Phillip, to Millmaster Onyx Corporation. Method of inhibiting algae utilizing trimethylbenzylaminoethylamine. 3,871,861, Cl. 71-67.000.

Merianos, John J.; and Adams, Phillip, to Millmaster Onyx Corporation. Amino derivatives of tetrasubstituted benzene compounds. 3,871,862, Cl. 71-67.000.

Mershon, Francis P.: *See—*
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Mertens, Wilfried: *See—*
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Merz, Gerhard; Gehrig, Heinz; and Chorbacher, Wilhelm, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for the manufacture of substantially spherical, silica-containing hydrogels. 3,872,217, Cl. 423-338.000.

Merz, Herbert; Langbein, Adolf; Walther, Gerhard; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. N-(furyl- or thienyl-methyl)-14-oxy-7,8-dihydro-normorphinones and -norcodeinones and salts thereof. 3,872,127, Cl. 260-285.000.

Mesiah, Raymond: *See—*
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Meyer, Engelbert A., to USM Corporation. Retainer clip. 3,871,430, Cl. 151-41.750.

Meyer, Hans-Rudolf, to Ciba-Geigy AG. Bis-aroxazolyl compounds, processes for their manufacture and their use. 3,872,094, Cl. 260-307.00D.

Meyniel, Jean-Pierre; and Roulle, Jean-Louis, to Pont-A-Mousson S.A. Device for forming tubes of thermoplastic material by extrusion. 3,871,807, Cl. 425-326.00R.

Michal, Gerhard: *See—*
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Michel-Wolwertz, Marie-Rose; Dujardin, Esther; and Sironval, Cyrille. Photosensitive composition containing a protochlorophyllide-apoprotein in complexed or in association with a polymeric material. 3,871,888, Cl. 96-88.000.

Microtech Press Inc.: *See—*
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Middelhoek, Servaas, to N. V. Hollandse Metallurgische Industrie Billiton. Process for the preparation of vanadium oxycarbide, oxynitride and oxycarbonitride. 3,872,136, Cl. 423-371.000.

Middleman, David, to Kappers Company Inc. Method and apparatus for guiding and tensioning a web during changeover from a web of one width to a web of another width. 3,871,564, Cl. 226-1.000.

Midland-Ross Corporation: *See—*
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Mikelsons, Valdis, to Minnesota Mining and Manufacturing Company. Coated aluminum substrates having a binder of aluminum hydroxyoxide. 3,871,881, Cl. 96-1.500.
Miki, Tokutaro, both of: *See*—
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Miley, David C., to Rucker Company, The. Continuous cable tension monitor. 3,871,217, Cl. 73-143.000.
Millard, Barry J.; and Jenvey, Leslie R., to Adwest Engineering Limited. Steering mechanisms. 3,871,469, Cl. 180-79.20R.
Miller, Darrow L.; and Wells, William Y., to Rockwell International Corporation. High power acoustical transducer with elastic wave amplification. 3,872,330, Cl. 310-8.000.
Miller, David A.: *See*—
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Miller, Edward A. Model airplanes and method of making same. 3,871,126, Cl. 46-78.000.
Miller, Eugene R.: *See*—
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Miller, Kenneth J., to A. L. Hansen Mfg. Co. Door lock means. 3,871,198, Cl. 70-146.000.
Miller, Kenneth J., to A. L. Hansen Mfg. Co. Fluid operated piston and cylinder means. 3,871,267, Cl. 92-24.000.
Miller, Laurence B.; and Crook, James D. Rotary extendable dipperstick. 3,871,538, Cl. 214-141.000.
Miller, Marion E. Pelvic brace. 3,871,367, Cl. 128-78.000.
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Mino, Masayuki; and Seino, Kuniki, to Minolta Camera Kabushiki Kaisha. Electrophotographic or xerographic method for treating a picture image. 3,871,878, Cl. 96-1.00R.
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Miquel, Jean: *See*—
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Misima, Yusi, to Shimazaki Mixing Equipment Co., Ltd. Combination pumping apparatus. 3,871,268, Cl. 92-13.300.
Mita Industrial Company, Ltd.: *See*—
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Mitchell, Baker A., Jr., to Community Health Computing, Inc. Hospital data processing system. 3,872,448, Cl. 340-172.500.
Mitchell, Wallace F., to Ammco Tools, Inc. Combined cutter and grinder attachment for lathe. 3,871,066, Cl. 29-560.000.
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Miyamoto, Kuichi, to Canon Kabushiki Kaisha. Discharger for electrophotographic copying apparatus. 3,872,307, Cl. 250-324.000.
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Moody, Burton E., to Air Products and Chemicals, Inc. Method of feeding solid carbonaceous material to a high temperature reaction zone. 3,871,839, Cl. 48-197.00R.
Mookherjee, Braja Dulal; Trenkle, Robert Walter; Vock, Manfred Hugo; and Shuster, Edward J., to International Flavors & Fragrances Inc. Process for altering fragrance with 4-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl(-2-butanone or 4-(6,6-dimethyl-2-methylene-3-cyclohexen-1-yl)-2-butanone. 3,872,031, Cl. 252-522.000.
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Morrison, Roger A., to Mobil Oil Corporation. Upgrading the octane value of naphtha employing a crystalline aluminosilicate zeolite which has a high silica to alumina ratio wherein aluminum is incorporated into the crystal latice of the zeolite. 3,871,993, Cl. 208-135.000.
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Moschgat, Robert G. Ultrasonic system for repelling noxious fauna. 3,872,472, Cl. 340-384.00E.

Mosshart, Crockett; and Martinkovic, Paul Steve, to Uniroyal, Inc. Traction tread band. 3,871,720, Cl. 305-51.000.

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Mounier, Bruce A. Gun barrel and firing mechanism for impact-actuated underwater guns. 3,871,120, Cl. 42-1.00L.

Mueller, Floyd F.; Aulik, Clarence J.; and Zeman, Paul R., to American Hospital Supply Corporation. Stirrup assembly for examination table. 3,871,637, Cl. 269-328.000.

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Mulcahy, Joseph Aloysius; Jones, Harry Joseph; and Batram, Stephen Douglas, to Ferrco Engineering Limited. Rod bundling and stacking apparatus. 3,871,533, Cl. 214-6.0FS.

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Mundy, William L., to O'Fallon Investment Company. Cutting tool for the continuous machining of metals and the method of making same. 3,871,251, Cl. 76-101.00A.

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Murakami, Mutsuaki; and Yoshimura, Susumu, to Matsushita Electric Industrial Company. Solid electrolytic capacitor and solid electrolyte therefor. 3,872,358, Cl. 317-230.000.

Murakami, Shiro; Kanda, Kenzi; Nakajyo, Jiro; and Yamasaki, Makoto, to Teijin Limited; and Teijin Seiki Co., Ltd. Device for imparting false twists on a filamentary yarn. 3,871,166, Cl. 57-77.450.

Murakami, Yuetsu: *See*—
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Murata, Masamichi; Urayama, Yuji; and Furusawa, Takamasa, to Victor Company of Japan, Ltd. Remote control system and apparatus for automatic telephone answering and recording apparatus. 3,872,254, Cl. 179-6.00E.

Murata, Noboru, to OKI Electric Industry Co., Ltd. Method and apparatus for detecting cracks in unhulled grains. 3,871,774, Cl. 356-201.000.

Murata, Rikizo, to Olympus Optical Company, Limited. Device for simultaneously manufacturing a plurality of fiber bundles. 3,871,591, Cl. 242-18.00G.

Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pyroelectric element of polymer film. 3,872,318, Cl. 307-88.0ET.

Murray, Jay P.; and Wasson, Kenneth L., to Armstrong Cork Company. Remodeling ceiling clip. 3,871,150, Cl. 52-498.000.

Murray, Jerome L.; and Gardiner, Frances R. Hygienic douche system. 3,871,518, Cl. 206-219.000.

Murry, Edward J., to Fibra-Sonics, Inc. Ultrasonic/chemical cleaner for contact lenses. 3,871,395, Cl. 134-107.000.

Murtland, Delbert Lyle. Electrical conducting fluid tight tubular assembly. 3,871,734, Cl. 339-94.00M.

Murvall, Ake Eugen, to Abu Aktiebolag. Nut locking devices. 3,871,785, Cl. 403-259.000.

Musgrove, Ralph E., to GeoResources, Inc. Process for extracting phosphate from solutions. 3,872,002, Cl. 210-59.000.

Muto, Ryujiro; Furuuchi, Shigemasa; Ukihashi, Hiroshi; Uchijima, Katsuo; and Nishimura, Hiromichi, to Asahi Glass Company, Ltd. Liquid crystal cell. 3,871,746, Cl. 350-160.0LC.

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Nagase, Shunji; Baba, Hajime; Kodaira, Kazuo; Abe, Takashi; and Yonekura, Michimasa. Electrolytic process for production of perfluorocyclohexane derivatives. 3,871,975, Cl. 204-59.00F.

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Nakazawa, Hidetsugu; Enei, Hitoshi; Kubota, Koji; and Okumura, Shinji, to Ajinomoto Co., Inc. Biological method of producing serine and serinol derivatives. 3,871,958, Cl. 195-29.000.

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Nance, W. Franklin; and Shacklett, Robert L., to NS Electronics; and Lenz, Vernon Creig, a part interest to each. Digital communications system with time-frequency multiplexing. 3,872,255, Cl. 179-15.0BM.

Nann, Erwin S., to Cri-Dan. Screw thread cutting machine. 3,871,252, Cl. 82-25.000.

Nash, Harold Garth, to Motorola, Inc. CMOS operational amplifier with internal emitter follower. 3,872,390, Cl. 330-13.000.

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Nemoto, Hidetaro; Kawawa, Takaho; Sato, Hideki; Sakamoto, Eiichi; Koyano, Takayuki; and Anzai, Takanori, to Nippon Kokan Kabushiki Kaisha. Method of adding rare earth metals or their alloys into liquid steel. 3,871,870, Cl. 75-58.000.

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Nestor, David William; and Wible, Paul E., to Rucker Company, The. Portable ground fault interrupter. 3,872,354, Cl. 317-18.00D.

Netzel, Philip C., to I-T-E Imperial Corporation. Switchgear operating mechanism overcenter spring toggle with latched restraint. 3,872,273, Cl. 200-153.00G.

Neugroschl, Ernest J., to Goodyear Tire & Rubber Company, The. System and method for monitoring quality characteristics of a moving web. 3,871,212, Cl. 73-88.00A.

Neumann, Gerhard Max, to Delbag Luftfiler GmbH. Filter pack. 3,871,851, Cl. 55-521.000.

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Nicolas, Patrick Marie, to Republic of France, represented by the Minister of State for National Defense Delegation Ministerielle pour l'Armement, DPAG-Bureau des Brevets et Inventions. Process and device for deflection of a radiation beam. 3,872,299, Cl. 250-203.000.

Niemeyer, Heinrich, to Westfalia Separator AG. Centrifugal separator having valve in passageway beneath distributor foot. 3,871,575, Cl. 233-20.00A.

Nienburg, Hans Juergen; and Kummer, Rudolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Working up hydroformylation mixtures. 3,871,970, Cl. 203-6.000.

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Nishino, Atsushi; Iura, Yukihide; Kubo, Masayoshi; and Tateisi, Motosi, to Matsushita Electric Industrial Company. Bactericidal water purifier for dechlorinated water. 3,872,013, Cl. 210-317.000.

Nishizawa, Junichi. Pattern generator apparatus. 3,871,764, Cl. 355-18.000.

Nishizawa, Shunichi: *See—*
Adachi, Motoharu; Nishizawa, Shunichi; Ishida, Michiyasu; Kaneko, Takashi; and Yonenaga, Tasushi, 3,871,062.

Nissan Jidosha Kabushiki Kaisha: *See—*
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Nissan Motor Company, Limited: *See—*
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Nissen Motor Company, Limited: *See—*
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Nissen, Warren I.; and Perry, Roger L., to Gillette Company, The. Shaving system with a fixed edge between the blade edge and the guard. 3,871,073, Cl. 30-34.200.

Nissen, Warren I.; and Perry, Roger L., to Gillette Company, The. Razor with movable guard and concurrently movable blade platform. 3,871,077, Cl. 30-63.000.

Nisula, Pentti Samuel, to Lannen Sokeri Oy. Device for cutting peat band rolls. 3,871,255, Cl. 83-155.000.

Nitro-Nobel A.B.: *See—*
Lucole, Spencer W., 3,872,478.

Niu, Tokihide, to Matsushita Electric Industrial., Ltd. Switch in half-wave rectifier circuit. 3,872,277, Cl. 219-10.55B.

Nivas, Yogesh: *See—*
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Nixon, James: *See—*
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Norris, Alan H., to Bigelow-Sanford, Inc. Non-woven carpet material with resilient backing. 3,871,948, Cl. 161-154.000.

North America Philips Corporation: *See—*
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NS Electronics: *See—*
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Nuclear Data, Inc.: *See—*
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Numata, Saburo; Sagara, Iwao; and Shishikura, Hirohisa, to Fuji Photo Optical Co., Ltd.; and Oki Electric Industry Co., Ltd. Device for indicating digital exposure information in the viewfinder of a camera. 3,872,483, Cl. 354-53.000.

Nunes, John, to Brunswick Corporation. Method of conditioning 18–8 stainless steel. 3,871,925, Cl. 148-12.00E.

Nunn, Gary Franklin, to du Pont de Nemours, E. I., and Company. Splicing apparatus. 3,871,164, Cl. 57-22.000.

Nyman, Sven, to Almhults Bruk AB. Arrangement for weaving with a half-closed shed in a loom. 3,871,416, Cl. 139-72.000.

Nystrom, Roy B.: *See—*
Popovitch, Dragolyoub; Nystrom, Roy B.; Eneman, Melvin; Biro, Carl; and Alpert, Selwyn, 3,871,298.

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Oates, Gordon C.: *See—*
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Oatis, Melvin Neal, to Telephonic Equipment Corporation. Toll call prohibitor. 3,872,260, Cl. 179-18.0DA.

Obermaier, Anton; Drebinger, Peter; and Hoisl, Johann, to Siemens Aktiengesellschaft. Street traffic signalling system. 3,872,422, Cl. 340-41.00R.

O'Conor, Eugene F.: *See—*
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Oddo, Joseph A.: *See—*
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Odom, Donald M. Self-contained demountable dump bed. 3,871,706, Cl. 298-1.00A.

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O'Fallon Investment Company: *See—*
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Ogata, Yuzuru, to Kao Soap Co., Ltd. Process for the preparation of quaternary ammonium salts. 3,872,138, Cl. 260-404.000.
Ogden, Bruce Robert. Display board. 3,871,608, Cl. 248-223.000.
Ogle, Robert. Wire insulation stripper. 3,871,078, Cl. 30-90.100.
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Ohnishi, Toshiyuki, to Tokyo Shibaura Electric Co., Ltd. Ice making device. 3,871,189, Cl. 62-353.000.
Ohsawa, Mitsuo, to Sony Corporation. If amplifier. 3,872,393, Cl. 330-30.00D.
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Okutsu, Masaru; and Yamazaki, Akihiro, to Ajinomoto Co., Inc. Nucleoside-5'-diphosphate ethanolamines and method of producing the same. 3,872,083, Cl. 260-211.50R.
Olin Corporation: *See—*
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Olson, John W., Jr. Automotive refrigeration compressor module. 3,871,793, Cl. 417-273.000.
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O'Neil, Francis P.; Krauss, Ferd A.; Sambenedetto, Vincent; and Cooper, Christopher C., to Yoder Company, The. Recoiler paper stuffer. 3,871,594, Cl. 242-56.00R.
Onishi, Hiroshi: *See—*
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Onoda, Mineo; and Kimura, Takahiko, to Sumitomo Electric Industries, Ltd. Method and apparatus for producing sintered metal product. 3,871,200, Cl. 72-41.000.
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Brech, Heinz, 3,871,118.
Orr, Byron Reid, to Holsopple, Herman L., a part interest. Combination burp pad and bib. 3,871,027, Cl. 2-49.00R.
Oshima, Shigeru, to Fuji Photo Film Co. Ltd. Electronic shutter means. 3,872,488, Cl. 354-246.000.
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Otani, Yutaka: *See—*
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Otis Engineering Corporation: *See—*
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Otoda, Ichizo; Nakamura, Akio; Kanehisa, Takashi; Taki, Yasuo; and Yokozeki, Makoto, to Matsushita Electric Industrial Co., Ltd. Continuous rotary press. 3,871,206, Cl. 72-190.000.
O'Toole, Patrick J., to Joerns Furniture Company. Hospital bed service unit with combination night light/switch light assembly. 3,872,294, Cl. 240-2.00S.
Ott, James H., to Novar Electronics Corporation. Individual identification apparatus and method using frequency response. 3,872,443, Cl. 340-172.500.
Ott, James I.: *See—*
Schwab, Delmar G.; and Ott, James I., 3,871,266.
Ottinger, Lester V., to Champion International, Corporation. Method of manufacturing a foamed urethane structural product having high and low density portions. 3,872,199, Cl. 264-46.400.
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Overdijk, Willem B.; and Steen, Adam, to Hoogovens Ijmuiden B.V. Process for pressing briquettes from powdered substances more particularly from fine-grained fluorspar and briquettes thus obtained. 3,871,869, Cl. 75-53.000.
Owatonna Manufacturing Company, Inc.: *See—*
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Oxford Industries, Inc.: *See—*
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Pace, Henry A.; St. Cyr, David R.; and Bullard, Herbert L., to Goodyear Tire & Rubber Company, The. Liquid hydrocarbon derived resin. 3,872,064, Cl. 260-80.700.
Pacela, Allan F., to Interscience Technology Corporation. Impedance measuring system. 3,871,359, Cl. 128-2.10Z.
Pacesetter Systems, Inc.: *See—*
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Palatucci, Gerald J.: *See—*
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Palencher, Jacques, to Lebocey Industrie. Device for producing a false selvedge on a fabric as well as weaving looms provided with such a device. 3,871,414, Cl. 139-54.000.
Palmer, John, to National Research Development Corporation. Separating apparatus. 3,872,306, Cl. 250-312.000.
Pan-Nova, Inc.: *See—*
Greenwood, Robert C., 3,871,503.
Panaflight Corporation: *See—*
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Papa, Anthony J.; and Proops, William R., to Union Carbide Corporation. N-(2-hydroxyethyl)-ethyleneimines as catalysts for polyisocyanurate foam formation. 3,872,035, Cl. 260-2.5AW.
Papinchak, Michael J.: *See—*
Kolb, William A.; and Papinchak, Michael J., 3,871,633.
Papritz, Hans; and Hagi, Kurt, to Haag-Streit AG. Ophthalmological fixation lamp assembly. 3,871,753, Cl. 351-37.000.

Paramonoff, Elpidifor; and Olsen, Frederick C., to Standun, Inc. Fluid pressure monitoring device. 3,871,233, Cl. 73-389.000.

Parc, Guy: *See—*
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Pasqualucci, Carmine Renato; and Zucco, Giuseppe, to Arckifar Industrie Chimiche Del Trentino S.p.A. Process for the production of antibiotics. 3,871,966, Cl. 195-80.00R.

Pasqualucci, Carmine Renato; Bonfanti, Giovanni; Giovanni, Sesto San; and Cignarella, Giorgio, to Archifar Industrie Chimiche del Trentino S.p.A. Method for the production of d(-)-α-aminobenzylpenicillin directly from natural penicillins. 3,872,088, Cl. 260-239.100.

Pasternak, Israel S.: *See—*
King, Lawrence F.; Gaspar, Noel J.; and Pasternak, Israel S., 3,871,992.

Patigalia, Edward N., to United States of America, Army. Method of weighing solid material wetted by a non-reactive liquid. 3,871,489, Cl. 177-1.000.

Patterson, John W.; and Fried, John H., to Syntex (U.S.A.) Inc. 15 Deoxy PGE_2. 3,872,139, Cl. 260-468.00D.

Paul, David H.; and Rosey, Joseph A., to Goodyear Tire & Rubber Company, The. Method of curing foam inflated tires. 3,872,201, Cl. 264-55.000.

Paul, Walter: *See—*
Kuckhermann, Gustav; Feldkamper, Richard; Paul, Walter; and Brockmuller, Friedrich Franz, 3,871,270.

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Pazos, Jose F., to du Pont de Nemours, E. I., and Company. Polymers coupled by nitroso groups. 3,872,057, Cl. 260-75.0TN.

Peaker, Anthony Ralph; and Mottram, Anthony, to Ferranti Limited. Electroluminescent devices and apparatus including such devices. 3,872,314, Cl. 250-552.000.

Pease, Edmund M., to Xynetics, Inc. Automated data library system including a flat plane memory. 3,872,445, Cl. 340-172.500.

Pedicar Corporation: *See—*
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Pei, Yu K., to Owens-Illinois, Inc. Method of making glass-ceramic matrix using closed tubes. 3,871,852, Cl. 65-4.000.

Pelto, Clarence H. Telescoping stairway. 3,871,479, Cl. 182-86.000.

Penasse, Lucien; and Barthelemy, Pierre, to Roussel Uclaf. Preparation of salts of alpha-D glucose-phosphoric acid. 3,872,085, Cl. 260-234.00R.

Pentney, Harry, to Gillette Company, The. Safety razor with a plural strip blade magazine. 3,871,075, Cl. 30-40.100.

Pentron Industries, Inc.: *See—*
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Peressini, Peter P.: *See—*
Bogardus, E. Hal; Peressini, Peter P.; and Reith, Timothy M., 3,871,067.

Perldal, Karl Lennart, to AB Volvo Penta. Boat lock. 3,871,199, Cl. 70-252.000.

Perrott, Francis Cyril. Transportation means. 3,871,300, Cl. 104-130.000.

Perry, Donald S.; Fowler, Wyland L.; Shattuck, Richard E.; and Mueller, Hans W. Spoolless ribbon cartridge with lift and feed features combined. 3,871,507, Cl. 197-151.000.

Perry, Roger L., to Gillette Company, The. Razor having a stationary guard and an axially shiftable guard. 3,871,076, Cl. 30-60.500.

Perry, Roger L.: *See—*
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Nissen, Warren I.; and Perry, Roger L., 3,871,077.

Perucchi, Norbert: *See—*
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Pestka, John August; and Lindeman, Richard Jay, to Illinois Tool Works Inc. Take-up pulley. 3,871,241, Cl. 74-242.11R.

Petersen, Sigrud R.; Ying, Sui-Chun; and Mann, August C., to Westinghouse Electric Corporation. Rotating rectifier assembly for brushless exciters. 3,872,335, Cl. 310-68.00D.

Peterson, Daniel E.: *See—*
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Peterson, Kenneth L., to Andersen Corporation. Method for reducing the occurrence of bowing in wooden window rails. 3,871,428, Cl. 144-323.000.

Peterson, Steven H.; Carp, Ralph W.; and Weissler, Harold E., to Bendix Corporation, The. Means for selecting an adaptive braking system controlling speed signal. 3,872,317, Cl. 307-10.00R.

Petersson, Leif Gunnar, to Facit-Halda Aktiebolag. Tabular device for an office machine. 3,871,508, Cl. 197-176.000.

Petro-Tex Chemical Corporation: *See—*
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Petry, Charles J., to Hazelett Strip-Casting Corporation. Method of forming a protective, flexible, insulating coating for covering the metal casting surface of a flexible casting belt. 3,871,905, Cl. 117-75.000.

Peyser, Harry A., to Continental Can Company, Inc. Child-proof closure cap. 3,871,544, Cl. 215-225.000.

Pfarrwaller, Erwin, to Sulzer Brothers Ltd. Deflecting beam for warp threads in a weaving machine. 3,871,419, Cl. 139-114.000.

Pfarrwaller, Erwin, to Sulzer Brothers, Ltd. Weaving machine having a variable weft yarn path. 3,871,421, Cl. 139-122.00R.

Pfizer Inc.: *See—*
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Scanio, Charles J. V., 3,871,977.

Pflum, August S. Combination drapery support. 3,871,082, Cl. 16-87.200.

Phelps, Richard B.: *See—*
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Philibert, Robert A.; and Browne, Frank L., to General Signal Corporation. Clamping device. 3,871,091, Cl. 24-243.00R.

Philip Morris Incorporated: *See—*
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Phillips Petroleum: *See—*
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Chapman, Charles C., 3,872,181.
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Phipps, Arthur L. Foam extrusion die. 3,871,812, Cl. 425-466.000.

Phipps, John Alastair: *See—*
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Piber, Earl T., to Cutler-Hammer, Inc. Off locking in-line trigger switch. 3,872,274, Cl. 200-157.000.

Pickett, Charles G.; and Khattab, Ghazi, to Bio-Medical Sciences, Inc. Thermometer construction. 3,871,232, Cl. 73-356.000.

Piekarski, Sophie A.: *See—*
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Pierre, Bernard: *See—*
Bayard, Jean Claude; Fournet, Louis; Jacob, Jean; Pierre, Bernard; and Roux, Marcel, 3,871,297.

Pierron, Claude Raymond; Jenny, Jean Paul Joseph; and Zuccaro, Robert, to Plymatic. Method of assembling neck accessories to clothing articles and articles thus obtained. 3,871,028, Cl. 2-143.000.

Pietryka, Joseph, to Fives Lille-Cail. Dummy bar for continuous casting. 3,871,441, Cl. 164-274.000.

Pigeroulet, Jean; and Brunel, Andre, to Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A. Device for limiting the delivery per revolution of an injection pump. 3,871,344, Cl. 123-139.0ST.

Piglione, Luigi; *See—*
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Pile, Benjamin D., to United States of America, Army. Collapsible tripod support. 3,871,607, Cl. 248-171.000.

Pilkington Brothers Limited: *See—*
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Pilloff, Herschel S., to United States of America, Navy. Transverse laminar flow dye laser cell. 3,872,403, Cl. 331-94.500.

Pillsbury Company, The: *See—*
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Sinner, Joseph M.; Galle, Edward L.; Kolosky, Joseph F.; and Mikkelson, Marvin O., 3,872,230.

Piniot, Daniel, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Vehicle suspension device capable of correcting the trim of the vehicle. 3,871,681, Cl. 280-124.00F.

Pissiotas, Georg: *See—*
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Pitney-Bowes, Inc.: *See—*
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Plapp, Nile E.: *See—*
Melgaard, Hans; and Plapp, Nile E., 3,872,473.

Plasser, Franz, deceased (A-1010, by said Erna Plasser, heir); and Theurer, Josef. Method and apparatus for lining and leveling track. 3,871,299, Cl. 104-7.00B.

Plastic Coatings Limited: *See—*
Legge, Morris James; Phipps, John Alastair; and Corbett, Roger Patrick, 3,871,580.

Platzer, George E., Jr. Lazy-man type switching circuit. 3,872,319, Cl. 307-114.000.

Playart Limited: *See—*
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Plempel, Manfred: *See—*
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Plessey Handel Und Investments A.G.: *See—*
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Plessey Incorporated: *See—*
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Plokhov, Viktor Ivanovich: *See—*
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Plough, Charles T.; Eastwood, H. Keith; and Arts, Marcus, to Multi-State Devices Ltd. Electrical relay device. 3,872,418, Cl. 338-23.000.

Plume, Robert W., to Travel Products, Inc. Upholstery attachment hardware. 3,871,041, Cl. 5-353.100.

Plymatic: *See—*
Pierron, Claude Raymond; Jenny, Jean Paul Joseph; and Zuccaro, Robert, 3,871,028.

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Polk, Donald E.; and Morris, Robert C., to Allied Chemical Corporation. Cutting blades made of or coated with an amorphous metal. 3,871,836, Cl. 29-194.000.

Polysar Limited-Polysar Limitee: *See—*
MacLeod, Alastair Cameron, 3,872,037.

Pomfret, Edward E.; and Welsh, Norman C., to Gillette Company, The. Plural blade strip magazine with blade strip tensioning mechanism. 3,871,074, Cl. 30-40.100.

Pont-A-Mousson S.A.: *See—*
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Popovitch, Dragolyoub; Nystrom, Roy B.; Eneman, Melvin; Biro, Carl; and Alpert, Selwyn, to United States of America, Army. Detached lever timing movement for mechanical time fuze. 3,871,298, Cl. 102-84.000.

Poppe, Wassily: *See—*
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Population Research Incorporated: *See—*
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Porr, Karl-Heinz, to Gebruder Hischmann Maschinenfabrik. Device for drying moist material to be ground. 3,871,111, Cl. 34-173.000.

Porret, Daniel: *See—*
Habermeier, Juergen; Baumann, Dieter; Porret, Daniel; and Batzer, Hans, 3,872,097.

Porta Systems Corp.: *See—*
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Potter, Curtis N., to Sperry Rand Corporation. High frequency diode having simultaneously formed high strength bonds with respect to a diamond heat sink and said diode. 3,872,496, Cl. 357-81.000.

Poulsen, Peter D., to General Dynamics Corporation. System for protection from laser radiation. 3,871,739, Cl. 350-1.000.

Powell, Walter F.; and Grimshaw, Charles, to General Electric Company. Ballast having integral time delay relay. 3,872,350, Cl. 315-104.000.

Power, Basil Dixon: *See—*
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PPG Industries, Inc.: *See—*
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Frank, Robert G., 3,871,855.
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Mollohan, Kenneth L.; and Makhlouf, Joseph M., 3,872,040.
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Praeger, Eberhardt P.; and Stanton, Richard P., to Honeywell Information Systems Inc. Connector assembly having positive retention means. 3,871,733, Cl. 339-91.00R.

Pramstraller, Wilmut, to Durst S.p.A. Fabbrica Macchine ed Apparecchi Fototecnici. Device for adjusting focal distance of a photographic enlarging apparatus. 3,871,765, Cl. 355-18.000.

Pratt, George W., Jr.; and McMullin, Paul G., to Massachusetts Institute of Technology. Opto-electronic apparatus to generate a pulse-modulated signal indicative of the mechanical state of a system. 3,871,215, Cl. 73-136.00A.

Pray, Percy E. Multi-purpose bearing mount. 3,871,723, Cl. 308-15.000.

Precision Metalsmiths, Inc.: *See—*
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Priola, Aldo; Cesca, Sebastiano; and Ferraris, Giuseppe, to Snamprogetti, S.p.A. Process for the polymerization and copolymerization of isobutylene. 3,872,069, Cl. 260-85.30R.

Pritchard, Dalton Harold, to RCA Corporation. Color information translating systems. 3,872,498, Cl. 358-21.000.

Procop, Alex J.; and Boultinghouse, Ace, to Target Systems Corporation. Film projector and cartridge apparatus. 3,871,754, Cl. 352-29.000.

Procter & Gamble Company, The: *See—*
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Pryce, William; and Foster, Eric, to Northern Electric Company Limited. Slitting of an electrically charged tape. 3,871,253, Cl. 83-8.000.

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Puleo, Salvatore J. Automatic satin ball machine. 3,871,158, Cl. 53-214.000.

Pulk, Elgas; and Noren, John Paul, to Stabilator AB. Conveying and mixing arrangement, particularly for powdered and/or particulate masses. 3,871,628, Cl. 259-165.000.

Pullman Incorporated: *See—*
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Purdue Research Foundation: *See—*
Rechtsteiner, Steve A.; Nelson, Philip E.; and Heron, John R., 3,871,824.

Puritan-Bennett Corporation: *See—*
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Putman, Richard E. J., to Westinghouse Electric Corporation. Control system and method for limiting power demand of an industrial plant. 3,872,286, Cl. 235-151.210.

Quantz, James Bland. High production nutcracking apparatus. 3,871,275, Cl. 99-571.000.

Queiser, Horst; Schwarz, Horst; and Schroter, Hans-Jurgen, to Licentia-Patent-Verwaltungs-G.m.b.H.; and Bergwerksverband GmbH. Process of radioactive waste gases. 3,871,841, Cl. 55-66.000.

Queiser, Horst; and Schwarz, Horst, to Licentia-Patent-Verwaltungs G.m.b.H. Exhaust gas cleaning system for handling radioactive fission and activation gases. 3,871,842, Cl. 55-179.000.

Quick, Elwyn B., to Walter J. Kreske, a part interest. Building element for beach and play structures. 3,871,143, Cl. 52-309.000.

Quick Jerry L.; and Maxwell, James D., to Maxwell Manufacturing Co. Trolling speed indicator. 3,871,219, Cl. 73-184.000.

Quigley, Joseph R.: *See—*
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R. W. Hartnett Company: *See—*
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Raditz, Michael G.: *See—*
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Radlove, Sol B.; Ravve, Abraham; and Brown, Kenneth H., to Continental Can Company, Inc. Stabilized ethylenically unsaturated beta-hydroxy esters prepared from a polyepoxide and acrylic or methacrylic acid. 3,872,162, Cl. 260-486.00B.

Radscheit, Kurt: *See—*
Stache, Ulrich; Haede, Werner; Fritsch, Werner; Radscheit, Kurt; and Lindner, Ernst, 3,872,081.

Radutsky, Grigory Avramovich: *See—*
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Rambausek, Hugo: *See—*
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Rambauske, Werner R.; and McFarland, Philip J., to Raytheon Company. Catoptric lens arrangement. 3,871,751, Cl. 350-293.000.

Rameau, Jean, to Regie Nationale Des Usines Renault; and Societe Dite Des Automobiles Peugeot. Arrangement for driving a fluid-circulating pump. 3,871,790, Cl. 415-219.00C.

Ramsey, William K. Method and apparatus for recording and retrieving railroad locomotive speed data. 3,872,479, Cl. 346-1.000.

Randrup, Benjamin F., to F. Korbel and Brothers, Inc. Conveyor device. 3,871,515, Cl. 198-287.000.

Rands, Steve A. Multiple-compliant-bristle, self-centering self-sizing rotary abrasive hone. 3,871,139, Cl. 51-334.000.

Ranganathan, Ramachandran S.: *See—*
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Rase, Howard F.; and Maddox, Larry A. Hydrodesulfurization of heavy hydrocarbon feedstocks with nonstoichiometric titanium carbide catalyst support. 3,871,998, Cl. 208-216.000.

Rasmussen, Clarence E., to Electronic Control Corporation. Power control timing circuits with power line compensation. 3,872,374, Cl. 323-22.0SC.

Ratte, Jacques; and Bigras, Jean, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defense. Molding process for bonding insula in rachet motor casing. 3,872,205, Cl. 264-175,000.

Rauenbusch, Erich: *See—*
Huper, Fritz; Rauenbusch, Erich; Schmidt-Kastner, Gunter; Bomer, Bruno; and Bartl, Herbert, 3,871,964.

Rauer, Heinz Gunter: *See—*
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Raulerson, Sidney W. Marine drive system. 3,871,325, Cl. 115-34.00R.

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Ray, John S.; and King, James D., to said Ray, by said King. Battery monitor. 3,872,457, Cl. 340-249.000.

Ray, John S.: *See—*
Ray, John S.; and King, James D. (assors. to said Ray, by said King), 3,872,457.

Ray, Michael W., to Miner Enterprises, Inc. Sway follower assembly for railway car coupler. 3,871,530, Cl. 213-69.000.

Raymond Lee Organization, Inc., The: *See—*
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Stave, Frederick Roland, 3,871,663.

Reamey, Herbert K.; and Newman, Jerry F., to Reynolds Metals Company. Joint ramming cement for electrolytic reduction cell cathodes. 3,871,986, Cl. 204-243.00R.

Rechtsteiner, Steve A.; Nelson, Philip E.; and Heron, John R., to Purdue Research Foundation. Method of aseptically connecting a fitting to an aseptic storage tank. 3,871,824, Cl. 21-58.000.

Recognition Equipment Incorporated: *See—*
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Reed International Limited: *See—*
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Rees, J. Samuel. Apparatus for selectively guarding a rotary blade. 3,871,260, Cl. 83-478.000.

Reflector Hardware Corporation: *See—*
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Regnault, Alain, to Redelec, Societe a responsabilite limitee. High-voltage D.C. generator, specially for energizing an electrostatic apparatus. 3,872,370, Cl. 317-3.000.

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Reilly, James Park, to Lindsay Specialty Products Limited. Signal directional tap. 3,872,408, Cl. 333-10.000.

Reinert, Gerhard; and Kleemann, Alois, to Ciba-Geigy AG. Process for the optical brightening of organic fibre material. 3,871,898, Cl. 117-33.50T.

Reinicke, Helmut; Stockburger, Dieter; Teutsch, Theo; Vogel, Ludwig; Wistuba, Hermann; and Engelbach, Heinz, to Badische Anilin & Soda-Frabrik Aktiengesellschaft. Separation of anthraquinone from a mixture of its vapor with a carrier gas. 3,872,135, Cl. 260-369.000.

Reith, Timothy M.: *See—*
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Renard, Charles J.; and Rifken, Louis L. Portable luggage or load carrier. 3,871,676, Cl. 280-35.000.

Renaud, Henri. Method of preparing a corrosion-resistant and ductile iron alloy with a high aluminum content. 3,871,868, Cl. 75-53.000.

Renders, Herman E. A.: *See—*
Keijzer, Johan H.; Jossa, Louis J.; Renders, Herman E. A.; and Oancea, Alexandru, 3,871,679.

Rendessy, William L. Trailer sway control device. 3,871,686, Cl. 280-446.00B.

Rennerfelt, Sven Beinhard. Shaft coupling. 3,871,786, Cl. 403-300.000.

Repella, James A., to Federal-Mogul Corporation. Rotary shaft seal with shaft runout protection. 3,871,669, Cl. 277-182.000.

Republic of France, DPAGA-Bureau des Brevets & Inventions, represented by the Minister of State for National Defense, Delegation Ministerielle Pour l'Armement: *See—*
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Republic of France, represented by the Minister of State for National Defense Delegation Ministerielle pour l'Armement, DPAG-Bureau des Brevets et Inventions: *See—*
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Rey, Maurice, to "Le Nickel"; and "Societe Miniere et Metallurgique de Penarroya". Method for producing nickel by segregation of its oxide ores. 3,871,873, Cl. 75-82.000.

Reynolds Metals Company: *See—*
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Reynolds, Thomas Linn, to Motorola, Inc. Fusible link memory cell for a programmable read only memory. 3,872,450, Cl. 340-173.0SP.

Rhone-Polenc S.A.: *See—*
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Rhone-Poulenc S.A.: *See—*
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Rich, Leonard G., to Gerber Scientific Instrument Company, The. Pulse counting phase modulation method and apparatus for controlling a servo-mechanism. 3,872,369, Cl. 318-603.000.

Richard-Merrell Inc.: *See—*
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Richards Manufacturing Company: *See—*
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Richardson, William L.: *See—*
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Richmond, Rex E.; and Spector, George. Fluid filled insoles. 3,871,117, Cl. 36-43.000.

Richter, Roy E., to Cragar Industries, Inc. Custom wheel assembly. 3,871,708, Cl. 301-9.0DN.

Ridlen, Charles W. Control device for a hydrostatic transmission. 3,871,177, Cl. 60-431.000.

Rieper, Helmut; Kruger, Gerd; Keck, Johannes; Noll, Klaus-Reinhold; and Kahling, Joachin, to Boehringer Ingelheim GmbH. 3-(Aminomethylene)-5-phenyl-1,4-benzodiazepen-2-ones. 3,872,090, Cl. 260-239.30D.

Rifken, Louis L.: *See—*
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Rijnten, Hendrik Theodorus; and Eikema, Eduard Theodoor Jasper, to Lever Brothers Company. Process for the preparation of partially sulfided metallic supported catalysts. 3,872,028, Cl. 252-439.000.

Riley, Stephen Philip: *See—*
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Riss, Pierre: *See—*
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Ritzerfeld, Gerhard. Variable-mode rotary duplicator. 3,871,640, Cl. 271-9.000.

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RLK Research Inc.: *See—*
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Roart Plastics, Inc.: *See—*
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Robert Bosch, GmbH: *See—*
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Robertshaw Controls Company: *See—*
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Robertson, Neil George Douglas, to Wiggins Teape Research & Development Limited. Manufacture of non-woven fibrous material from a foamed furnish. 3,871,952, Cl. 162-101.000.
Robillard, Jean Jules Achille, to Kabushiki Kaisha Ricoh. Photochromic copying method. 3,871,886, Cl. 96-48.00R.
Robinson, Glen: *See*—
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Robinson, John W.; and Howell, Stephen L., to Kimball International, Inc. Electronic organ having delayed fill in. 3,871,262, Cl. 84-1.170.
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Romanski, Eric R.; Horn, J. Drew; and Dutt, William H., to Albany International Corporation. Novel high temperature resistant fabrics. 3,871,946, Cl. 161-88.000.
Romanzi, Louis, Jr.; and Gavagan, James A., to Irwin Industries, Inc. Safety belt buckle. 3,871,090, Cl. 24-230.0AV.
Ronka, Vaino, to Hudson Bay Mining and Smelting Co., Limited. Airborne electromagnetic prospecting method and apparatus. 3,872,375, Cl. 324-4.000.
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Rose, Morton Jessup. Method and device for anti-theft securing of a space. 3,871,282, Cl. 109-31.000.
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Rosen, Perry, to Hoffmann-La Roche Inc. 16-Diazoketones of the androstane, pregnane, estrane, and 19-norpregnane series. 3,872,076, Cl. 260-141.000.
Rosenthal Stemag Technische Keramik AG: *See*—
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Sarem, Amir M., to Union Oil Company of California. Mobility controlled caustic flooding process for reservoirs containing dissolved divalent metal cations. 3,871,452, Cl. 166-270.000.

Sarem, Amir M., to Union Oil Company of California. Mobility controlled caustic flooding process for highly heterogeneous reservoirs. 3,871,453, Cl. 166-270.000.

Sasaki, Rentaro; Watanabe, Akinori; and Ogasawara, Tatsuo, to Oki Electric Industry Co., Ltd.; and Okaya Electric Industry Co., Ltd. Cold cathode discharge display apparatus. 3,872,352, Cl. 315-169.00R.

Sasaki, Rentaro; Watanabe, Akinori; Ikegame, Mamoru; and Ogasawara, Tatsuo, to Oki Electric Industry Co., Ltd.; and Okaya Electric Industry Co., Ltd. Cold cathode discharge type display apparatus with integral memory. 3,872,464, Cl. 340-343.000.

Sassi, Pietro Angelo: *See—*
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Sauer, Louis E., to L. E. Sauer Machine Co. Clamping means for split rotary anvil and the like. 3,871,777, Cl. 403-20.000.

Sauri, Richard. Safety and escape mechanism. 3,871,480, Cl. 182-100.000.

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Schaum, Helmut; and Gossel, Helmut, to Hoechst Aktiengesellschaft. Extractive recovery of a manganese acetate catalyst from residue recovered from distillation of an acetic acid feed produced by the oxidation of acetaldehyde. 3,871,971, Cl. 203-43.000.

Schedrovitsky, Savely Solomonovich; Goncharevich, Leonid Fomich; Pruss, Karl Vladimirovich; Lebedev, Alexei Pavlovich; and Gontar, Valentin Nikolaevich. Crane boom-out transmitter. 3,872,458, Cl. 340-267.00C.

Scheidweiler, Andreas, to Cerberus AG. Fire detector and method employing assymetrical integrator. 3,872,449, Cl. 340-228.100.

Schell, William J., to Aerojet-General Corporation. Membrane separation apparatus. 3,872,014, Cl. 210-232.000.

Schenk, Walter; Dahlinger, Roland; and Stockburger, Dieter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of vinyl sulfonates and vinylsulfonic acid from carbyl sulfate. 3,872,165, Cl. 260-513.00R.

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ichevey, William R.; and Kremers, Frank J., to Allied Chemical Corporation. Polymeric etch resist strippers and method of using same. 3,871,929, Cl. 156-2.000.

Schexnayder, Isby L., Jr.; and Angers, John W., to J & L Engineering Company, Inc. Sugar cane harvester. 3,871,162, Cl. 56-14.300.

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Schlosser, Hermann: *See—*
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Schmidt, Ulrich: *See—*
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Schnackenberg, Werner D.; and Lane, James M., III, to Gates Rubber Company, The. Power transmission belts. 3,871,240, Cl. 74-234.000.

Schneider, Adolf, to Siemens Aktiengesellschaft. Apparatus for elimination of interference from video signals. 3,872,246, Cl. 178-7.200.

Schneider, Guenter, to Siemens Aktiengesellschaft. Method and apparatus for tuning coaxial-line section resonators. 3,872,413, Cl. 333-82.00B.

Schneider, Hans Wernhard. Electric switches. 3,872,269, Cl. 200-67.0AA.

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Schreier, Donald R. Random selector switch and game. 3,871,652, Cl. 273-94.00R.

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Schuller, Karl-Heinz; and Nink, Horst, to Rosenthal Stemag Technische Keramik AG. Method for the production of highly wear-resistant ceramic material. 3,871,891, Cl. 106-65.000.

Schulte, Anthonius Maria; and Van Der Wal, Uilko, to N. V. Hollandse Signaalapperten. Mechanism for coupling two objects. 3,871,778, Cl. 403-52.000.

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Schutz, Richard F., to Hipotronics, Inc. Mobile, accurately mechanically variable high reactive power inductor having low headroom requirements suitable for transport on a utility vehicle. 3,872,414, Cl. 336-134.000.

Schwaar, Edouard; and Paroz, Andre, to Tavre Marc & Co. S.A. Timepiece. 3,871,169, Cl. 58-42.500.

Schwab, Delmar G.; and Ott, James I., to Hyster Company. Hydraulic cylinder phasing system. 3,871,266, Cl. 91-412.000.

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Schwanz, Wilfried; Fiala, Ernst; Warnecke, Rolf; and Buchholz, Peter, to Volkswagenwerk Aktiengesellschaft. Safety belt tensioning device. 3,871,470, Cl. 180-82.00C.

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Scott, Rollo L.; and Overby, Robert F., to Munsingwear, Inc. Placket forming machine. 3,871,307, Cl. 112-121.150.

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Seiler, Wolfgang; and Schmidt, Ulrich, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Apparatus for determining small amounts of carbon monoxide or hydrogen in atmospheric air. 3,871,827, Cl. 23-254.00R.

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Seligman, Herbert L.; Schwartz, Marvin; and Diamond, Warren, to United States of America, Navy. Ships inertial navigation storage and retrieval system (sinsars). 3,872,284, Cl. 235-150.270.

Selness, Jerry N. Sailing game apparatus. 3,871,656, Cl. 273-131.00B.

Senelet, Bernard C., to Societe Anonyme dite: Potain Poclain Materiel. Device for statilization of an appliance. 3,871,685, Cl. 280-150.500.

Senft, Ernst; and Von der Ohe, Manfred, to Daimler-Benz Aktiengesellschaft. Independent wheel suspension for non-steered wheels of motor vehicles. 3,871,467, Cl. 180-73.00C.

Servillat, Gabriel, to Verdol S.A. Reversible verdol jacquards. 3,871,412, Cl. 139-1.00E.

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Shames, Oscar; Hinds, James L.; Raditz, Michael G.; and Palatucci, Gerald J., to United States of America, Navy. Fruit reduction by probe selection. 3,872,476, Cl. 343-6.5LC.

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Shaw, Hugh E., Jr., to PPG Industries Inc. Method of and apparatus for detecting defects and the position thereof in transparent articles. 3,871,773, Cl. 356-200.000.

Shaw, Milton C., to Lawrence Peska Associates, Inc., a part interest. Board game apparatus. 3,871,658, Cl. 273-133.000.

Sheard, John Leo, to du Pont de Nemours, E. I., and Company. Capacitors with nickel containing electrodes. 3,872,360, Cl. 317-258.000.

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Shishikura, Hirohisa: *See—*
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Shoemaker, Kent P. Railroad grain door. 3,871,278, Cl. 105-378.000.

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Shum, Lanson Y.; Sienkiewicz, Leon J.; and Gogniat, Theodore, to Westinghouse Electric Corporation. Control system for sensing the vibration and lateral force on a cutting tool. 3,872,285, Cl. 235-151.110.

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Siddall, John E.; and Fried, John H., to Zoecon Corporation. Synthesis of α, β-unsaturated compounds. 3,872,101, Cl. 260-326.50E.

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Singleton, Alan H., to Bethlehem Steel Corporation. Production and utilization of synthesis gas. 3,872,025, Cl. 252-373.000.

Sinner, Joseph M.; Galle, Edward L.; Kolosky, Joseph F.; and Mikkelson, Marvin O., to Pillsbury Company, The. Method for producing food compositions having a nut-like texture. 3,872,230, Cl. 426-98.000.

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Sizer, Phillip S.; and Young, Carter R., to Otis Engineering Corporation. Methods of treating wells. 3,871,456, Cl. 166-298.000.

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Skildum, John D. Method and device for inhibiting the corrosion of metallic surfaces. 3,871,823, Cl. 21-2.50B.

Skoyles, Derek Robert, to U.S. Philips Corporation. Anti-lock vehicle brake systems. 3,871,716, Cl. 303-21.00F.

Skvarenina, John. Refrigeration system and flow control device therefor. 3,871,187, Cl. 62-196.000.

Slack, Robert W. Exercise apparatus. 3,871,646, Cl. 272-67.000.

Slana, Matthew Francis, to Bell Telephone Laboratories, Incorporated. Apparatus for realigning electrical connector terminal pins. 3,871,424, Cl. 140-147.000.

Slayton, Curtis R., to General Electric Company. Hermetically sealed compressor suction tube assembly. 3,871,800, Cl. 418-248.000.

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Smith, Darrell Franklin, Jr.; and Clatworthy, Edward Frederick, to International Nickel Company, Inc., The. Heat treatment of nickel alloys. 3,871,928, Cl. 148-142.000.

Smith, Gary W.; and Lemcke, George A., to Parish Manufacturing Inc. Milk dispenser container. 3,871,559, Cl. 222-183.000.

Smith, Gerald D.; and Owens, Frank R., to Carson Manufacturing Company, Inc. Electronic flasher circuit. 3,872,353, Cl. 315-200.00A.

Smith, Gerald R.; and Brittingham, Oscar Jerome, III, to Cadre Corporation, The. Vehicle identification method and apparatus. 3,872,283, Cl. 235-150.200.

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Smith, Wayne L., to Mine Safety Appliances Company. Air filter with bags. 3,871,848, Cl. 55-374.000.

Smith, William Novis, Jr., to Foote Mineral Company. Process for the production of lithium chloride. 3,872,220, Cl. 423-499.000.

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Soames, Michael Richard; Knowles, William Ralph; and Braggins, Donald William, to Image Analysing Computers Limited. Method and apparatus for checking measurements made in image analysis systems. 3,872,243, Cl. 178-6.800.

Societe Anonyme dite: Aquitaine Total Organico: *See—*
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Spillman, Kurt; and Arx, Georg Von, to Von Roll AG. Combustion grate structure. 3,871,287, Cl. 110-8.00R.

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Stegmeier, William J. Reusable ledger board with a nail-loosening means. 3,871,147, Cl. 52-127.000.

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Stegmeier, William James. Joint structure for concrete materials and the like. 3,871,787, Cl. 404-48.000.

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Takahasi, Takemitsu; Yamazaki, Keigi; and Tanaka, Hirosi, to Fuji Spinning Co., ltd. Process of making leather like sheet material. 3,871,938, Cl. 156-246.000.
Takamizawa, Akira; Hirai, Kentaro; Oikawa, Hiroshi; and Inazu, Kunihei, to Shionogi & Co., Ltd. Certain thiamine disulfide compounds. 3,872,123, Cl. 260-256.50B.
Takase, Shinji; and Yamazi, Takahiko, to Nippon Oil company, Limited. Catalyst for the conversion of hydrocarbon, a method for the preparation of the catalyst. 3,872,029, Cl. 252-453.000.
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Van Horn, Joseph M.; Epstein, Paul; and Phillipps, Patrick G., to Brattle Instrument Corporation. Timing biological imaging, measuring, and therapeutic timing systems. 3,871,360, Cl. 128-2.05R.
Vann, Roy R.; and George, Flint R., to Vann Tool Company, Inc. Packer actuated vent assembly. 3,871,448, Cl. 166-128.000.
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Vaughn, Walter Lee; and Beam, Robert James, to Dow Chemical Company, The. Cellulosic materials internally sized with low molecular weight copolymers of alpha, beta-ethylenically unsaturated hydrophobic monomers and ammoniated carboxylic acid comonomers. 3,872,039, Cl. 260-17.4ST.
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Vignaud, Jean-Pierre; Sebire, Claude; and Riss, Pierre, to Regie Nationale Des Usines Renault. Methods of and devices for braking and indexing the spindle of a machine tool rotating at high speed. 3,872,365, Cl. 318-265.000.

Vilen, Erik O.; and Zygas, Vytas, to G. S. Blakeslee & Co. Self leveling mechanism for tray cart. 3,871,725, Cl. 312-71.000.

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Vissers, Bastiaan; and Teunissen, Willem. Process for regenerating resin-bonded foundry sand. 3,871,438, Cl. 164-5.000.

Vock, Manfred Hugo: *See—*
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Vogler, Paul A., to "Strolee" of California, a division of U.S. Industries, Inc. Connecting device for load bearing members. 3,871,783, Cl. 403-205.000.

Vogt, Harald; and Moller, Walter, to International Telephone and Telegraph Corporation. Rotary-piston motor with improved cylinder chamber moving seals. 3,871,799, Cl. 418-178.000.

Vold, Ingebret Hadland; and Taylor, David Hutton, to Thermo King Corporation. Demountable transportation refrigeration unit. 3,871,188, Cl. 62-298.000.

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Vul, Alexandr Yakovlevich; Shik, Alexandr Yakovlevich; Dobryakova, Natalia Alexandrovna; Saidashev, Ibragim Ibragimovich; and Shmartsev, Jury Vasilievich. Optoelectronic device. 3,872,300, Cl. 250-205.000.

Vydrin, Vladimir Nikolaevich; Ageev, Leonid Matveevich; and Gustov, Vladimir Alexandrovich. Continuous strip rolling mill. 3,871,221, Cl. 72-205.000.

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Walcker, Jake J. Fuel system for internal combustion engine. 3,872,191, Cl. 261-145.000.

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Watanabe, Takao; Kohchi, Akira; and Fujii, Toshinobu, to Kabushiki Kaisha Meidensha. Quartz crystal resonator and a method for fabrication thereof. 3,872,411, Cl. 333-72.000.

Watanabe, Tetsuya; and Suzuki, Noboru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Apparatus for use in quenching and absorbing gas emanating from a waste incinerator. 3,871,305, Cl. 110-119.000.

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Wilder, Arthur G.; and Bridwell, Harold C., to Christensen Diamond Products Company. Abrasive particles encapsulated with a metal envelope of allotriomorphic dentrites. 3,871,840, Cl. 51-295.000.

Wilder, Leslie N.; Soltis, George L.; Nenninger, Theodore P.; and Ciaraldi, Anthony, to Dictaphone Corporation. Hand-held dictate and playback instrument. 3,872,263, Cl. 179-100.1DR.

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Wohlfarth, Arnon, to Bayer Aktiengesellschaft. Vessel for pneumatically mixing powdered or granular material. 3,871,626, Cl. 259-36.000.

Wold, Ivar, to Analog Devices, Incorporated. Integrating analog-to-digital converter having digitally-derived offset error compensation and bipolar operation without zero discontinuity. 3,872,466, Cl. 340-347.0NT.

Wolfgang, Brenner; Gunter, Feier; and Antonius, Vinnemann, to Sulzer Brothers Limited. Jacquard mechanism. 3,871,415, Cl. 139-59.000.

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Woodrich, Kenneth H., to Woodall Industries Inc. Catamaran. 3,871,316, Cl. 114-61.000.

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Wright, Dale W., to Miles Machinery Company. Chuck apparatus for clamping varied sized workpieces to be machined. 3,871,670, Cl. 279-2.00R.

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Wright, Joseph H., to Polaroid Corporation. Photographic film handling cassette and apparatus. 3,871,755, Cl. 352-130.000.

Wright, Peter C.; and Kirsch, Donald L., to Gidon Industries, Inc. Pipe clamp. 3,871,690, Cl. 285-226.000.

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Wunsche, Edgar, to Engineered Metal Products Company, Inc. Modular divisible barrel-shaped shell for metallurgical furnaces. 3,871,632, Cl. 266-35.000.

Wurth, Hans-Jorg, to Knorr-Bremse GmbH. Brake control device for railway vehicles. 3,871,718, Cl. 303-22.00R.

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Yamagishi, Fumiaki; and Kitagawa, Kenro, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Detergent compositions. 3,872,020, Cl. 252-89.000.

Yamaguchi, Akio: *See—*
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Yamahata, Takashi: *See—*
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Yamamoto, Hajime; and Watanabe, Kazuhiro, to Nippon Telephone and Telephone Public Corporation. Digital transmission system. 3,872,381, Cl. 325-42.000.

Yamamoto, Yushi, to Nippondenso Co., Ltd. Secondary air supply system for an internal combustion engine. 3,871,175, Cl. 60-307.000.

Yamamura, Kinzo: *See—*
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Yamanaka, Masami; and Masuda, Yasutoshi, to Yamato Scale Company, Limited. Axle load meter. 3,871,491, Cl. 177-45.000.

Yamanaka, Teruo; and Sato, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Toyota Cluo Kenkyusho. Method and apparatus for measuring distance to moving target. 3,872,475, Cl. 343-14.000.

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Yamazaki, Akihiro: *See—*
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Yamazaki, Eiichi; and Yamaguchi, Akio, to Hitachi, Ltd. Colour picture tubes. 3,872,345, Cl. 313-403.000.

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Yasuda, Naohiko; Ariyoshi, Yasuo; and Toi, Koji, to Ajinomoto Co., Inc. Method of producing active amino acid esters. 3,872,099, Cl. 260-326.400.

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Yeakley, John, to American Enterprise of Charlotte, Inc. Vehicle pacer system and a method of spacing moving vehicles along a traffic lane of a roadway. 3,872,423, Cl. 340-43.000.

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Yoshii, Tetsuji, to Matsushita Electric Industrial Co., Ltd. Cassette type magnetic recording and reproducing apparatus. 3,872,509, Cl. 360-137.000.

Yoshikawa, Shinsuke; and Sawa, Yuji, to Kureka Kagaku Kogyo Kabushiki Kaisha; and Mitsui Toatsu Chemicals Inc. Method for producing biaxially stretched receptacles by blow molding. 3,872,203, Cl. 264-94.000.
Yoshikawa, Yoshio; and Suzumori, Takeo, to Mitsubishi Gas Chemical Co., Ltd. Method for producing anhydrous sodium hydrosulphite using sodium formate, formic acid or formic acid ester. 3,872,221, Cl. 423-515.000.
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Zaderei, Nikolai Nikolaevich; Nikiforov, Arnold Serafimovich; and Ushankov, Evgeny Petrovich. Device for sealing a high-temperature conduit. 3,871,689, Cl. 285-189.000.
Zahorsky, James Theodore: *See—*
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Zax, Grigory Iosifovich: *See—*
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Zepell, Nathan A. Mechanical writing instrument. 3,871,775, Cl. 401-31.000.
Zick, Warren H., to PPG Industries, Inc. Herbicide and method for controlling weeds. 3,871,866, Cl. 71-106.000.
Zimmerman, Merritt A., to Tetrahedron Associates, Incorporated. Rotary valve internal combustion engine. 3,871,340, Cl. 123-80.0BA.
Zimmers, Melvin; and Gerber, Gary A., to Coleco Industries, Inc. Convertible game table assembly. 3,871,655, Cl. 273-123.00R.
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Zucker, Joseph, to GTE Laboratories Incorporated. Surface wave filter for tv if stage. 3,872,410, Cl. 333-72.000.
Zuckerman, Arie Jeremy, to National Research Development Corporation. Cell lines and virus culture. 3,871,954, Cl. 195-1.100.
Zulian, Ferruccio: *See—*
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Albert, Rudolf, Firma : *See*—
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Arth, Glen E., D. Johnston, and L. H. Sarett, to Merck & Co., Inc. Ring a unsaturated-20-oxo-11,17-bis-oxygenated 16-methyl steroids of the pregnane series. Re. 28,369, 3–18–75, Cl. 260—397.450.
Bonarrigo, Joseph F., Jr. Grate bar assembly for a rock crusher. Re. 28,368, 3–18–75, Cl. 241—88.4.
Braue, Charles E., to Data Appliance Corp. Pressure operated layered electrical switch and switch array. Re. 28,365, 3–18–75, Cl. 200—86.
Corazza, Marshall L., to Scott Paper Co. International Airport. Method for forming foam articles. Re. 28,364, 3–18–75, Cl. 264—51.
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McDonald, Alexander D. : *See*—
Rich, Frank D., Jr., and McDonald. Re. 28,367.
Merck & Co., Inc. : *See*—
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Rich, Frank D., Jr., and McDonald. Re. 28,367.
Rich, Frank D., Jr., and A. D. McDonald, to F. D. Rich Housing Corp. Building. Re. 28,367, 3–18–75, Cl. 52—79.
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Cobia, Barnell L., to B. L. Cobia, Inc. Cactaceae plant family. 3,693, 3–18–75, Cl. 88.
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Cobia, Barnell L. 3,693.
Framptons Nurseries Ltd. : *See*—
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Machin, Barrie J. to Framptons Nurseries Ltd. Chrysanthemum plant. 3,691, 3–18–75, Cl. 78.
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Altepeter, Henry. Vehicle body. 234,499, 3–18–75, Cl. D12—85.
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American Science & Engineering, Inc. : *See*—
Davidson, Gilbert. 234,534.
Barlow, Peter. Laminate trimmer. 234,490, 3–18–75, Cl. D8—98.
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Bobov, Vitislav Y., Belopolsky, Troyansky, and Farberg. 234,544.
Bobov, Vitislav Y., E. M. Belopolsky, G. L. Troyansky, and A. L. Farberg. X-ray apparatus. 234,544, 3–18–75, Cl. D83—1.
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Marchetti, Frank J. Telescopic sight eye protector. 234,540, 3–18–75, Cl. D57—1.
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Schweizer, Peter L., to Owens Illinois, Inc. Bottle. 234,493, 3–18–75, Cl. D9—137.
Shaw, James M. Container for firewood and the like. 234,489, 3–18–75, Cl. D7—212.
Sixt, Marty E., to Advance Drainage Systems, Inc. Down spout adapter. 234,516, 3–18–75, Cl. D23—45.
Sobotta, Reinhard, to Rollei-Werke Franke & Heidecke. Slide projector. 234,541, 3–18–75, Cl. D61—1.
Sowerbrower, James W. Dart game board. 234,527, 3–18–75, Cl. D34—5.
Spellier, Roland. Building block. 234,505, 3–18–75, Cl. D18—2.
Spellier, Roland. Building block. 234,506, 3–18–75, Cl. D18—2.
Stahel, Alwin J., to Texaco, Inc. Key holder. 234,548, 3–18–75, Cl. D87—8.
Stewart, Clarence E.: *See*—
Kommers, William J., and Stewart. 234,514.
Stuetzer, Franz A., and K. Mayer, to Rowenta-Werke, GmbH. Coffeemaker. 234,487, 3–18–75, Cl. D7—62.
Sumitomo Rubber Industries, Ltd.: *See*—
Kawakami, Masafumi, and Hasegawa. 234,500.
TIE/Communications, Inc.: *See*—
Marchese, Paul. 234,520.
Taguchi, Shuhei, and B. Mishiro, to Matsushita Electric Industrial Co., Ltd. Portable radio. 234,536, 3–18–75, Cl. D56—4.
Takenaka, Kazumasa: *See*—
Miyamoto, Masaaki, Takenaka, Kawamura, and Koda. 234,535.
Techni Med Inc.: *See*—
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Tennant Co.: *See*—
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Texaco, Inc.: *See*—
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Theimer, Ernst T., and D. J. Roslonski, to National Electro-Cook Corp. Packaging container for food or the like. 234,494, 3–18–75, Cl. D9—182.
Thomas & Betts Corp.: *See*—
Rynk, Edward F. 234,519.
Tjaarda, Thom: *See*—
De Tomaso, Alejandro, and Tjaarda. 234,545.
Trager, William R., to Ade Tennis, Inc. Wrist mounted tennis score recorder. 234,529, 3–18–75, Cl. D34—5.
Troyansky, Genrikh L.: *See*—
Bobov, Vitislav Y., Belopolsky, Troyansky, and Farberg. 234,544.
Waitzman, Simon V., to Colonial Mirror and Glass Corp. Planter. 234,530, 3–18–75, Cl. D35—3.
Warner-Lambert Co.: *See*—
Glaberson, Martin. 234,482.
Schick, George L. 234,483.
Wiebe, Hubert J., and M. V. Gearheart. Cooking utensil. 234,488, 3–18–75, Cl. D7—95.
Xerox Corp.: *See*—
Freeman, Jefferson, and Doppelt. 234,546.
Zawacki, Walter. Portable golf game target. 234,526, 3–18–75, Cl. D34—5.

CLASSIFICATION OF PATENTS

ISSUED MARCH 18, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

6 3,871,026
49R 3,871,027
143 3,871,028
161A 3,871,029
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CLASS 4

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252R 3,871,034

CLASS 5

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81R 3,871,036
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121 3,871,038
181 3,871,039
353.1 3,871,041

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149.1 3,871,821
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CLASS 13

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CLASS 14

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250.32 3,871,050
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328 3,871,052

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CLASS 17

21 3,871,084
32 3,871,085
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CLASS 19

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CLASS 21

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CLASS 23

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255R 3,871,831
259 3,871,832
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279 3,871,829
281 3,871,828
285 3,871,830

CLASS 24

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230AV 3,871,090
243R 3,871,091

CLASS 29

95R 3,871,092
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169.5 3,871,094
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191.2 3,871,835
194 3,871,836
252 3,871,053
267 3,871,054
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283 3,871,056
403 3,871,058
427 3,871,057
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428 3,871,060
431 3,871,061
470 3,871,062
470.5 3,871,063
475 3,871,064
560 3,871,066
571 3,871,067
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596 3,871,069
598 3,871,070
628 3,871,071
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40.1 3,871,074
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60.5 3,871,076
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90.1 3,871,078
294 3,871,079
346.51 3,871,080

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72 3,871,904
75 3,871,905
3,871,906
76P 3,871,907
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138.8E 3,871,910
138.8N 3,871,909
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235 3,871,374
269 3,871,375
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CLASS 144

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94 3,871,934
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PLANT PATENTS

12	:	3,693									

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*